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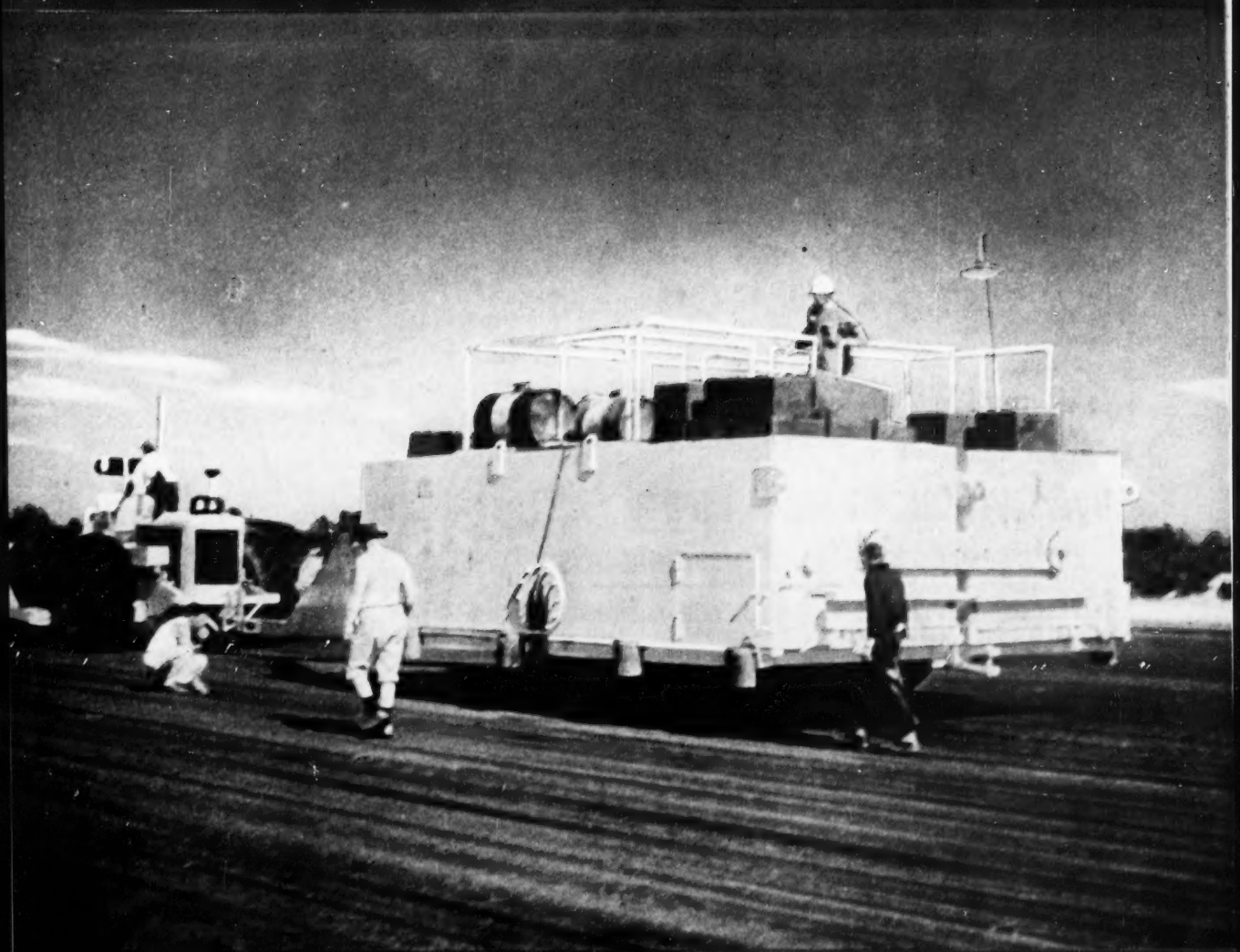
SEVENTY-NINTH YEAR OF PUBLICATION



Sequence plays: A 200-ton monster tests the capacity of a runway in Morocco (page 30).

Special Report

HOW GOOD ARE OUR AIRBASES IN MOROCCO?

ANOTHER OVERSEAS SURVEY BY WALDO BOWMAN

In this new Independence, Mo. sewage treatment plant,

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In the aerial view, taken during the early stages of construction, you see the two clarifiers, the trickling filter and the digester and control building at the right. The project also includes two pumping stations, 1½ miles of 8 and 12-inch force mains and 7½ miles of sewers ranging in size from 10 to 36 inches in diameter. Consulting engineer: Charles A. Haskins, Kansas City; contractor: Lippert Brothers, Inc., Oklahoma City, Okla.

Whether your sewage treatment plant is large or small, successful, economical operation depends heavily on the proper selection of material. Short-lived piping means early and costly repairs, and a heavy burden on the budget. Byers Wrought Iron pipe has demonstrated its exceptional qualities in practically every corrosive service, and provides a sound means of getting maximum life from the installation, with lower cost per year.

Our bulletin, WROUGHT IRON FOR SEWAGE TREATMENT AND DISPOSAL INSTALLATIONS, discusses the problems of corrosion encountered in numerous individual services. You'll find it helpful and informative. Write for a copy.

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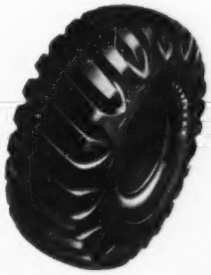

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Robert F. Boger

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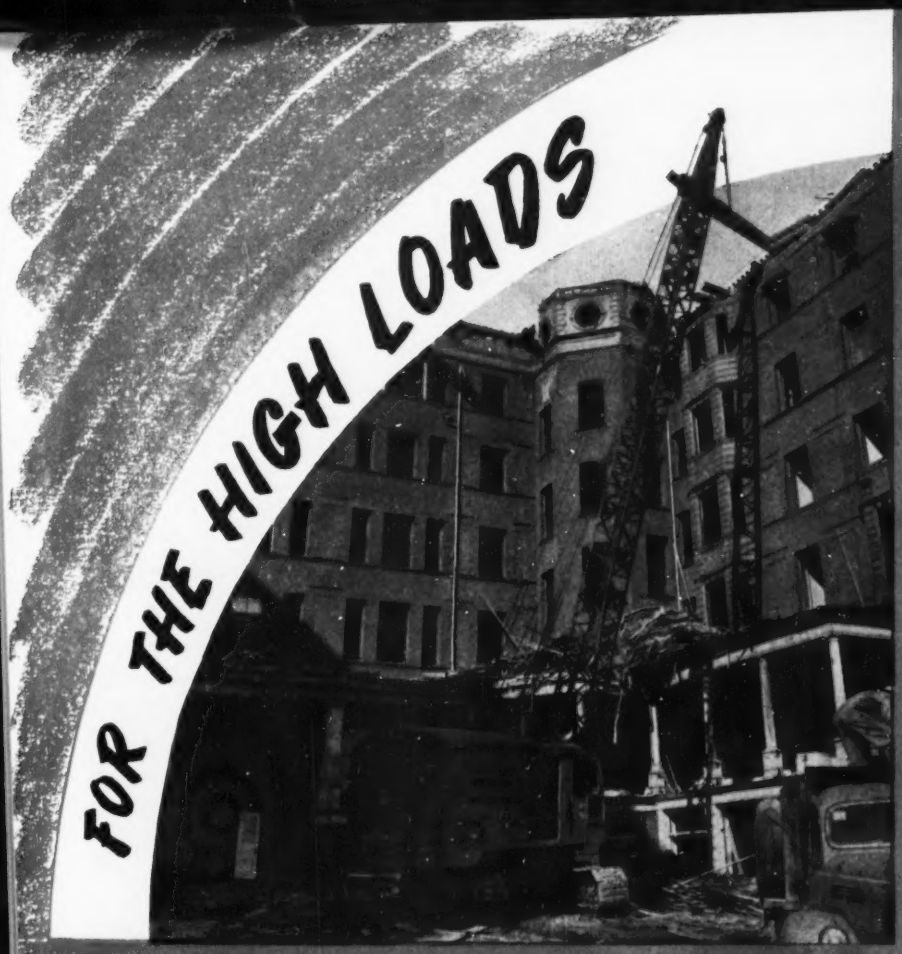

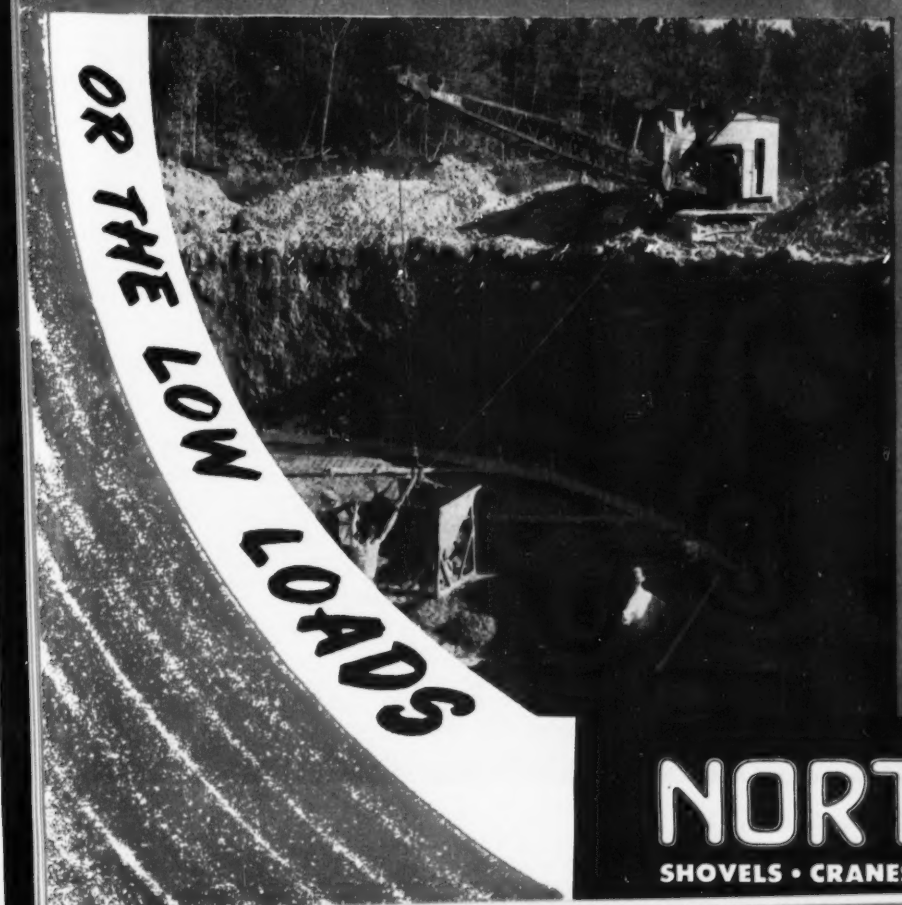

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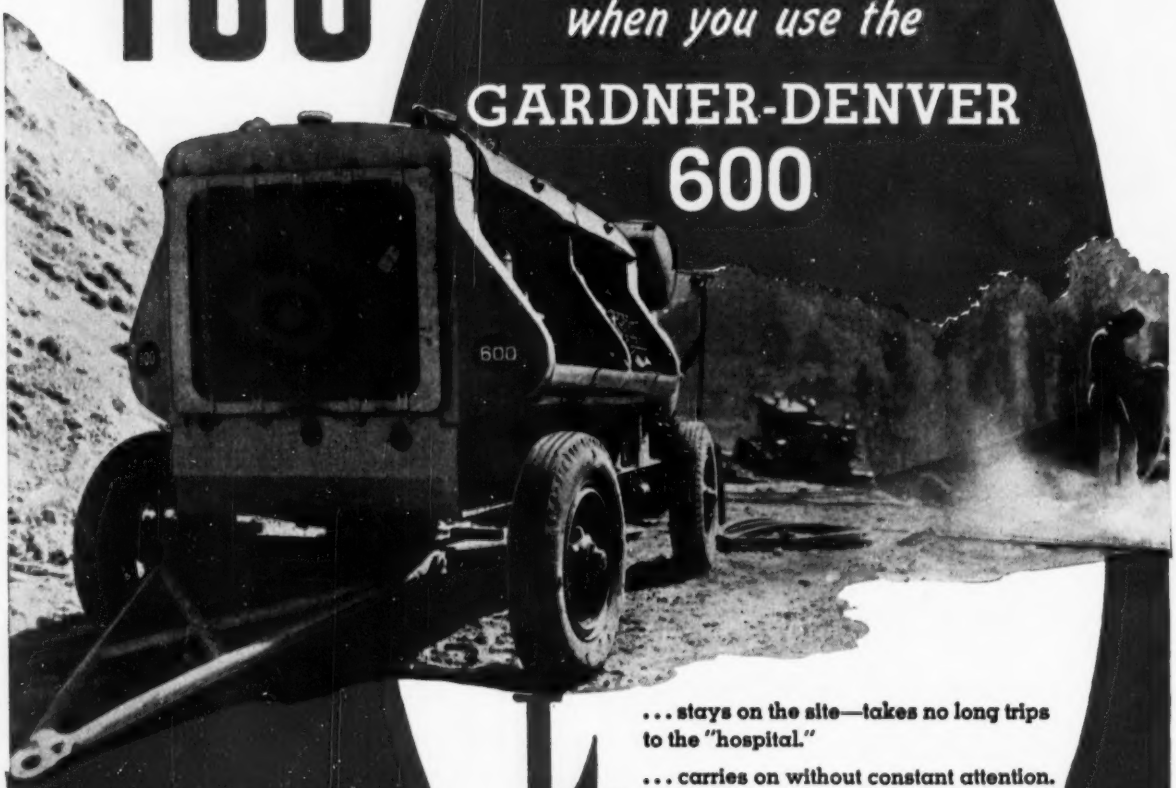

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What is drawbar horsepower?

Rubber-tired prime-movers have a sealed power train. They work through water, mud, dust without damage or wear to bearings and moving parts. Lubricants are not washed away or impregnated with abrasives.

Breaking up pavement, rock seams, etc., Tournatractor can tackle as tough jobs as any crawler. Loading may be slower, and cuts thinner on some of the heavy materials, but faster haul and return reduce cycle time.

Crawler tractors are rated by *drawbar* horsepower; competitive rubber-tired prime-movers are rated by *engine* horsepower. That makes things a bit confusing for you as a buyer. But, if you think about it a little bit, the different ratings become easy to understand.

The function of the crawler tractor was primarily to move a dead load from a standing start and then drag the load at a slow, crawling pace. That is exactly what "drawbar horsepower" ratings show. On that kind of assignment, the crawler tractor excels and can outperform anything of comparable engine horsepower on rubber.

To obtain a fair method of comparing crawler tractor efficiency, "drawbar horsepower" ratings are used as standardized measurement. This was, and still is, a reasonable standard for comparing crawlers. It is especially applicable because a vital factor in crawler engineering is to get as much horsepower as possible through the transmission and the 500 odd high-friction parts of the track-assembly . . . and to apply what is left in drawbar pull. Since the power loss is obviously extremely high, this measurement on the basis of "what is left" is extremely important in comparative rating of crawlers.

Old timers will remember that the track-tractor was originally developed to replace the horse and mule teams trained for steady slow-pulling on slip scraper and fresno work (range 100 to 200 feet). It was also applied to soft, muddy and rocky haul roads where wagons, wheeled scrapers and, later, small-tired trucks could not pull through. For this type of earthmoving work, drawbar horsepower was a reasonable measurement of production ability.

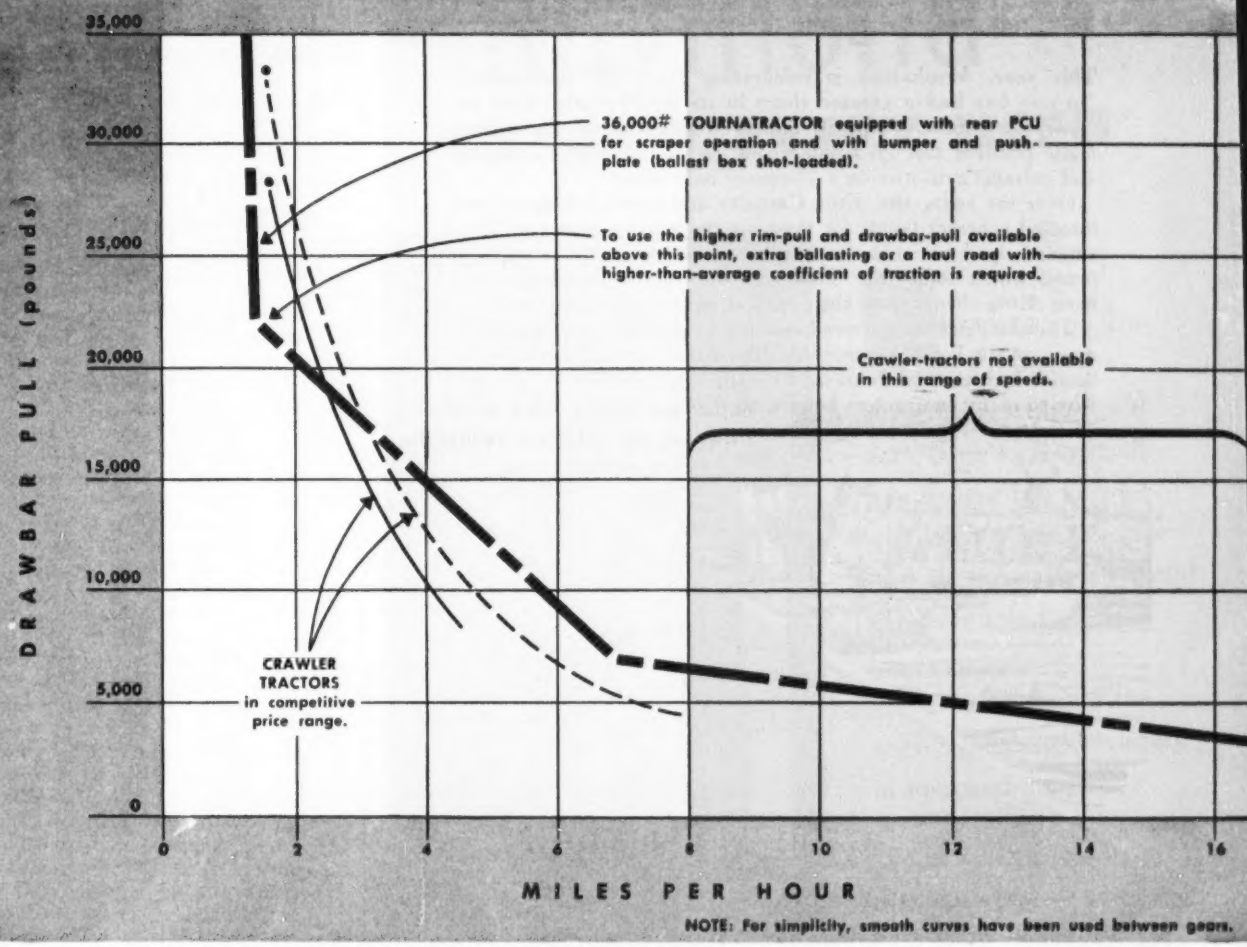
Then, as contractors sought ways for more speed and lower cost per yard in moving dirt, LeTourneau co-operated with the tire companies in developing bigger and bigger earthmoving tires. These gave off-road hauling similar speed advantages to those obtained by trucks, busses, and automobiles on the highways.

On sand jobs, rubber gives far better performance plus big savings in maintenance. In heavy sand states like Florida and Michigan, many contractors say they can't afford track upkeep and are switching 100% to modern LeTourneau-Westinghouse equipment. Abrasive wear is evidence of power lost.

Drawbar horsepower ratings are made on hard, firm footing with clean tracks. Remember what tracks look like after a few passes through mud like this? How much rated drawbar horsepower do you have left with mud packed into the 500 or more moving parts of a track assembly?

With instant finger-tip control on LeTourneau-Westinghouse prime-movers, you use power much more effectively than on the "strong-arm" manual system that controls crawler operation. You keep rolling on rubber . . . don't have to use the "standstill drawbar pull" used to rate crawlers.

Drawbar Comparison Chart



NOTE: For simplicity, smooth curves have been used between gears.

Published ratings on crawlers for drawbar-horsepower show maximum starting load with clean tracks on firm haul roads. While the crawler has an advantage on this "standstill" basis, you will note in this chart that, as soon as the load is underway, LeTourneau-Westinghouse Tournatractors give equivalent drawbar ratings to the slow-going track-tractors at higher hauling speeds. Under certain conditions, the crawler-tractor may slug it out in the mud to a little better advantage, but when moisture, etc., make the earth an acceptable construction material, the speed and drawbar of rubber-tired equipment produce a winning team for "lowest-net-cost-per-yard."

Big tires permitted the development of 2-wheel and 4-wheel prime-movers. This, too, changed dirtmoving to a competition for speed and large carrying capacity, rather than competition for a greater "standstill" push or pull.

Today efficient dirtmoving engineering measures the maximum load that can be kept moving at profit-making speed, rather than the maximum rating for starting a standing load. You will remember that the ox could start a heavier load than the horse, but the horse was a faster, more profitable work animal and became the most popular prime-mover of its day.

The same changeover is happening today in mechanized dirtmoving. The crawler on good track footing can still start a heavier load than a rubber-tired prime-mover. High-speed tractors on rubber, however, work so much faster that they move more dirt at the lowest net cost per yard and continually take over a larger percentage of jobs from the slow-going crawler-type tractor.

Thousands of owners of LeTourneau equipment have proved this for themselves on jobs all over the world. Ask your LeTourneau-Westinghouse Distributor for job studies that prove it. Then check it with a demonstration on your work. You can't afford to keep an "ox" to start dead loads, when your real problem is in keeping your loads hurrying along at a profitable speed.

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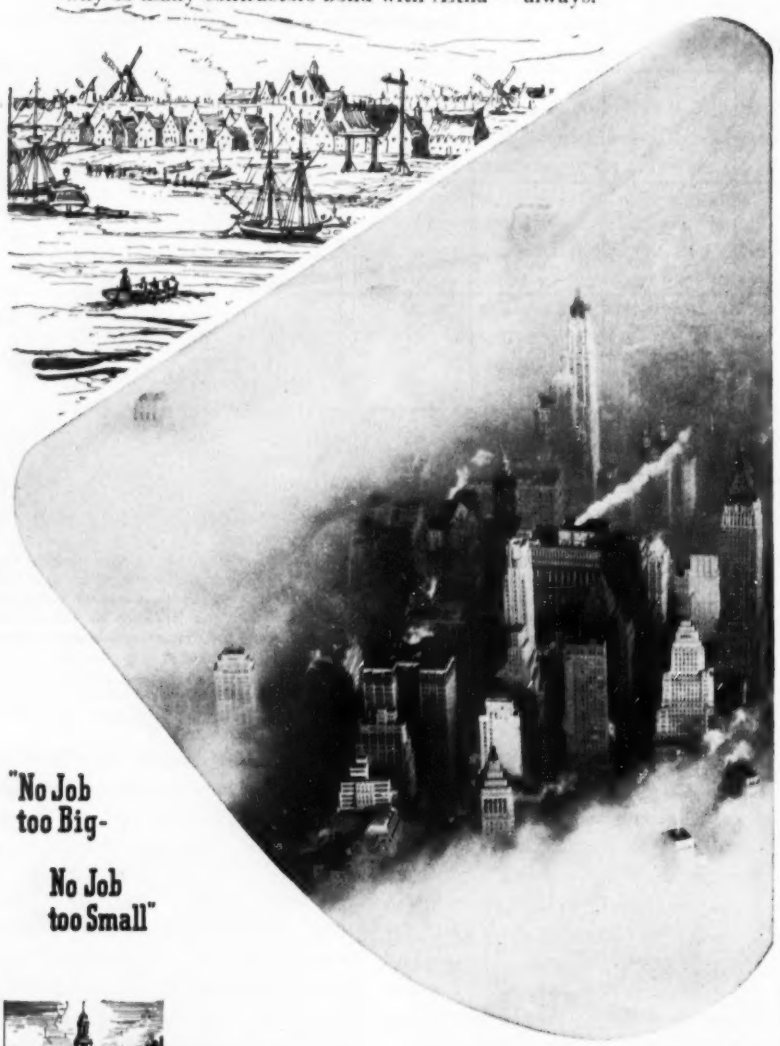

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READER COMMENT

Pipe-cost formula upheld

SIR: In reference to your article, Novel cost basis for water pipeline, (ENR May 21, p. 104) and the reader comment by J. A. Ellis, assistant sales manager of Southern Pipe and Casing Company (ENR July 9, p. 10), I would like to state that the city of Vallejo (Calif.) desired to give not only fair competition to the various pipe companies that might want to tender a quotation on the proposed project, but also to arrive at the lowest cost for transporting water continuously from one reservoir to another over a five-mile distance, taking into consideration a perpetual annual cost. We felt that a formula designed to take into consideration the various factors that enter into such a problem would be the only criterion for awarding the pipe contract.

The city of Vallejo has a number of pipelines now serving it. The oldest is of 12-in. cast-iron pipe 83 years old. This pipeline served the city until last year. Portions of the line were removed to be used over again in other locations; the retirement of this line was due solely to the fact that the supply reservoir was abandoned for waterworks purposes. The second oldest pipeline was a cast-iron line constructed in 1892; it is now 61 years old and after examination of this line we feel it will easily last another 40 years, probably more. The third transmission line was built in 1927; it is a steel line dipped in asphalt and wrapped on the outside with felt wrapping and asphaltic covering. This pipeline is ¼-in. thick and has pitted and corroded badly in a number of places.

Pipe has been replaced with concrete pipe in numerous sections and a large portion of the pipeline has been relined with concrete on the interior. We feel that the useful life of this pipe will not be extended more than a few more years, after which all of it will have to be protected with concrete against corrosion and further disintegration.

We have recently built a 32-mile pipeline of 36 and 27-in. diameter of concrete cylinder pipe. In taking bids on this pipe we had competition on steel pipe of ¼-in. thickness, having bitumastic lining, and on concrete cylinder pipe. The steel pipe, as the second best bidder, came within 1% of the low contract of $2,400,000, which was awarded to concrete cylinder pipe. We recently called for bids

(Continued on page 12)

Raymond Features!

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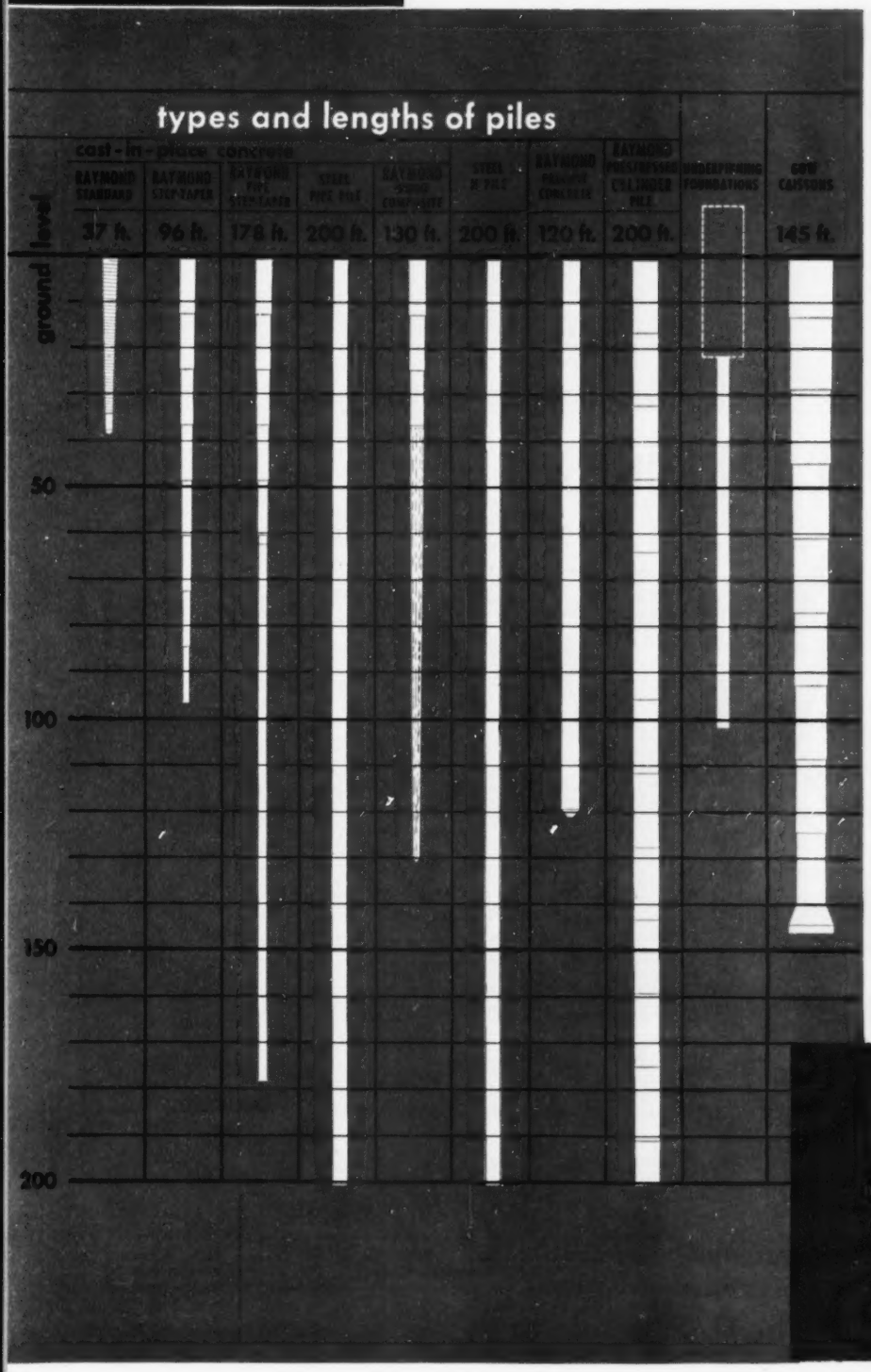
A Raymond PILE TO MEET EVERY NEED



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How to Plant a Road in a Swamp

Turning soggy, spongy swampland into a stable, lasting roadbed presents a formidable problem . . . until an Ellicott Dredge is put on the job. On a recent New Jersey road project, for example, this 12" Ellicott hydraulic dredge worked in swamps and marshes to remove a total of 250,000 cu. yds. of wet material. Then, it deposited 600,000 cu. yds. of approved fill for the roadbed.

The job report reads: "The project, which required the dredge to be moved overland from one site to another several times, was completed in just eight months!" And to cap this performance, the same unit was moved overland, down the roadbed it had pumped in, to work on an adjacent road job through a cedar swamp!

* * *

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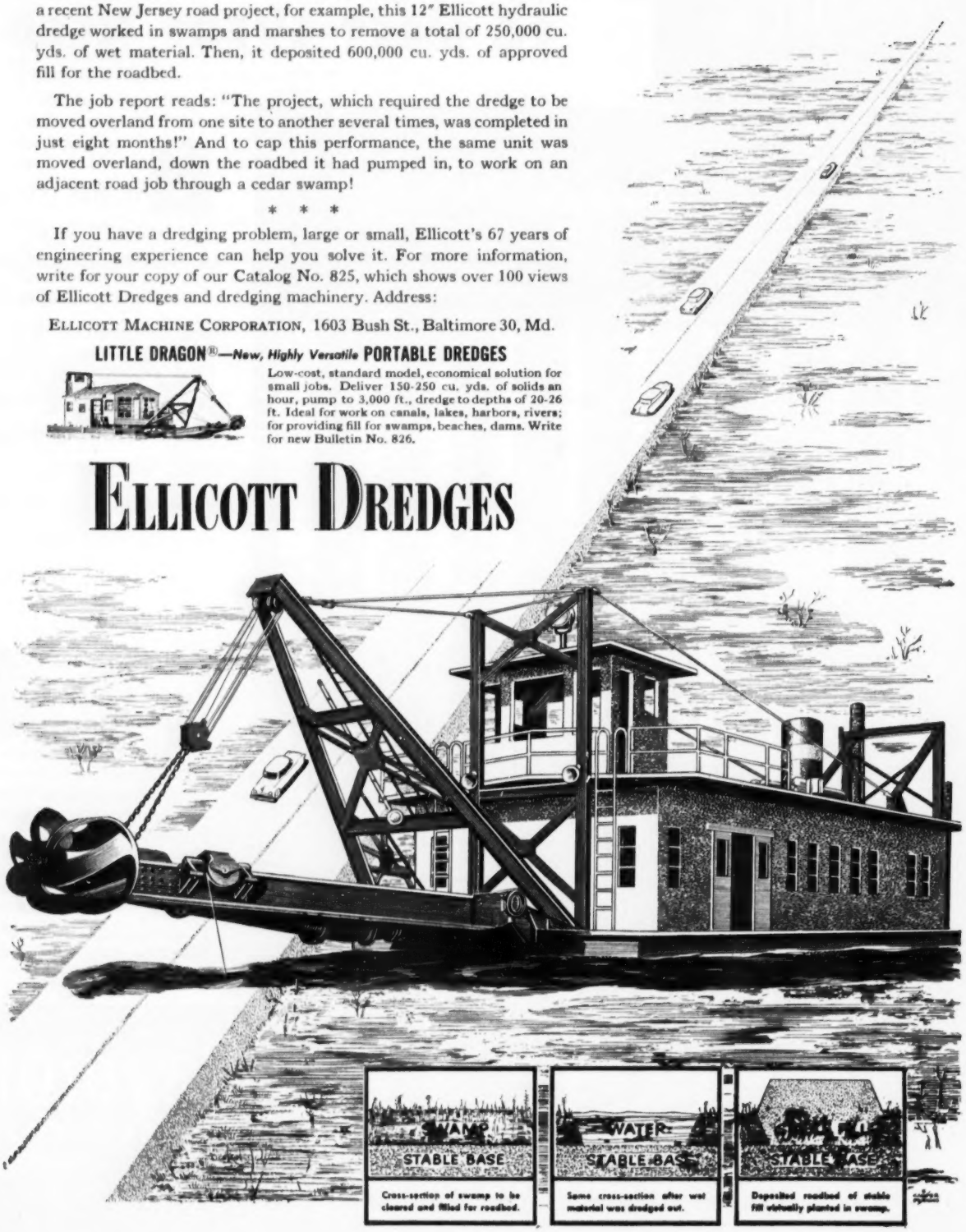
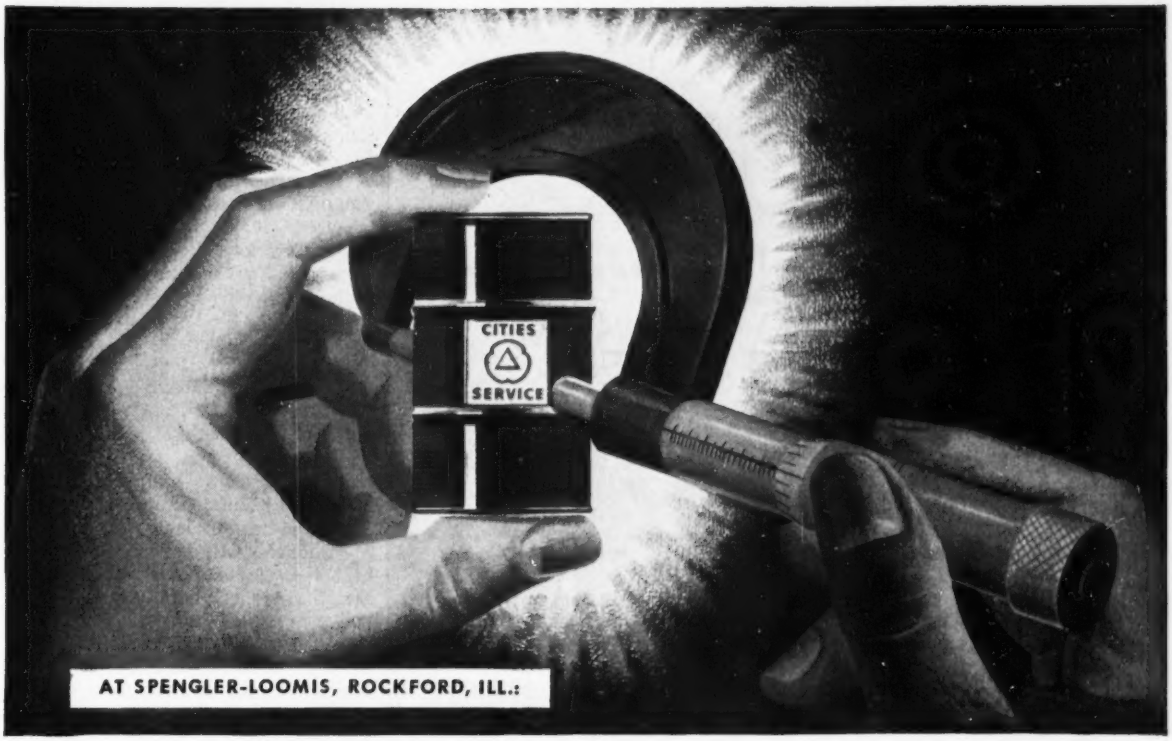
ELLICOTT DREDGES


SWAMP
STABLE BASE
Cross-section of swamp to be cleared and filled for roadbed.
WATER
STABLE BASE
Same cross-section after wet material was dredged out.
STABLE BASE
Dredged roadbed of stable fill virtually planted in swamp.



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Says Mr. C. J. Kostrzewa, Plant Superintendent: "Cutting oil requirements in our Automatic Pencil Sharpener Division are tough. To find the right coolant, we called for, and tested, samples from various companies. Over a period of testing time, we used graphs, charts and tables, keeping a running record on all coolants. As a final test, we measured the cutter with a micrometer before and after milling. The cutting oil that came out tops was Cities Service.

"I'd also like to point out that the Cities Service Engineering staff co-operated fully by offering helpful advice and excellent service."

Why not discuss your lubrication problems with a Cities Service lubrication engineer? Write Cities Service Oil Company, Dept. H-9, Sixty Wall Tower, New York 5, New York—or contact your nearest Cities Service office.

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READER COMMENT

on the 5-mile pipe-line using the formula as mentioned in your May 21 story. The contractors did receive bids on steel pipe but did not submit it since the price was too high to compete under the formula. Cast-iron pipe was also quoted and in two instances was low, the contractor entering the bid as his best bid. The concrete cylinder pipe, however, was the low bidder by the low contractors and, hence, was awarded the bid.

We feel that the low price obtained was definitely influenced by the wording of the formula which caused competition from a third type of pipe, in this case cast-iron, which otherwise could never have competed against concrete cylinder or steel pipe in direct bidding for low cost.

Although cast iron pipe would have been the most desirable due to longer life, the city engineer, city manager, and city council of Vallejo are convinced that the most economical pipe for the service required was obtained, under the peculiar conditions of the corrosive soil that is common to the terrain within and in the vicinity of the city of Vallejo.

T. D. KILKENNY
City Engineer and
Superintendent of Water Department
Vallejo, Calif.

CALENDAR

Joint meeting International Association for Hydraulic Research and Hydraulics Division of the American Society of Civil Engineers, University of Minnesota, Minneapolis, Sept. 1-4.

American Concrete Pipe Association, annual short course school of instruction, Sherman Hotel, Chicago, Ill., Sept. 10-12.

American Institute of Parks Executives, Denver, Colo., Sept. 13-18.

National technical conference on lighting, Illuminating Engineering Society, Hotel Commodore, N. Y., Sept. 14-17.

American Concrete Pipe Association, executive committee, Castll Harbour Hotel, Bermuda, Sept. 19-30.

National highway conference of county officials, American Road Builders Association, Lake Delton, Wis., Sept. 24-25.

National Electrical Industries Show, 69th Regiment Armory, New York City, Sept. 29-Oct. 2.

Southeastern Association of State Highway Officials, annual meeting, Asheville, N. C., Sept. 30-Oct. 3.

Conferences on Radiant Heating, Department of Architecture, Pratt Institute, Brooklyn, N. Y., Tuesday evenings, 7:30 to 9:30 p.m., October-November.

Engineers' Council for Professional Development, Hotel Statler, New York City, Oct. 14-17.

American Society of Civil Engineers, annual meeting, Hotel Statler, New York City, Oct. 19-23.

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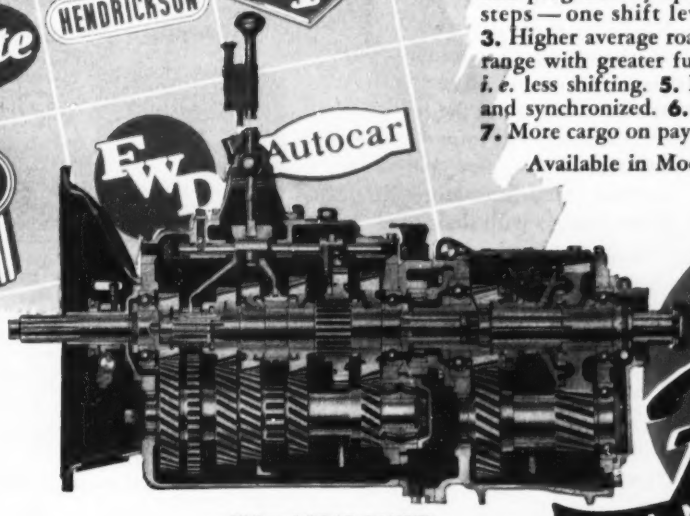

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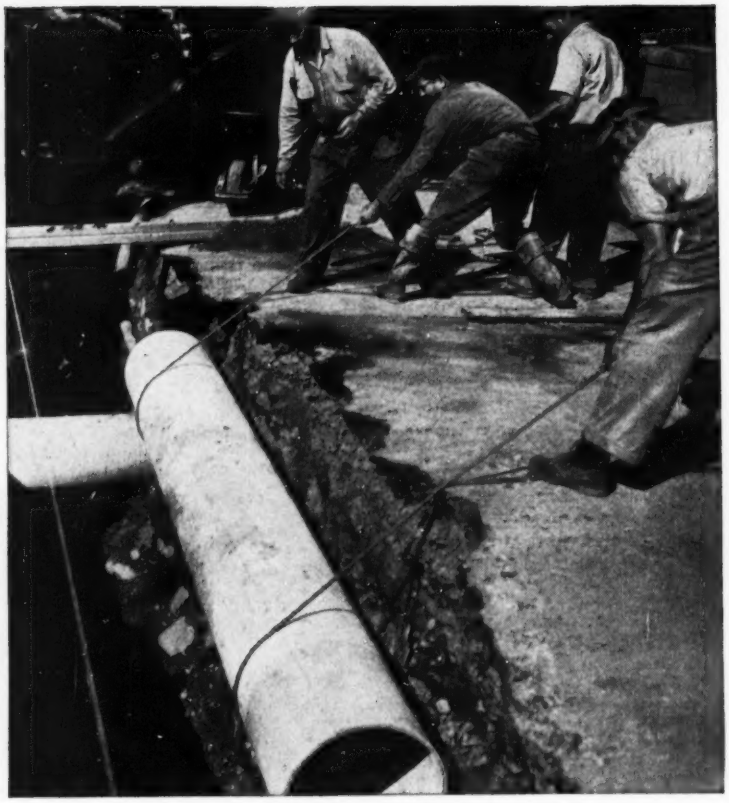

—Because of this RING-TITE JOINT used with Transite Sewer Pipe

Long 13-foot lengths of Transite* Pipe are rapidly assembled with the Ring-Tite Coupling. With it, dollars-and-cents savings will be realized every step of the way during construction of the line.

The 13-foot lengths reduce the number of joints and permit the pipe to be brought quickly and accurately to grade. Still more time is saved since each Ring-Tite joint can be checked as fast as it is assembled to reduce delays in backfilling and speed completion of the job.

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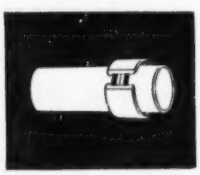

Two rubber rings and Transite Sleeve (see cut-away view) can be assembled quickly over Transite Pipe ends to make a pressure-tight joint. These flexible joints effectively absorb vibration, help compensate for soil movements.

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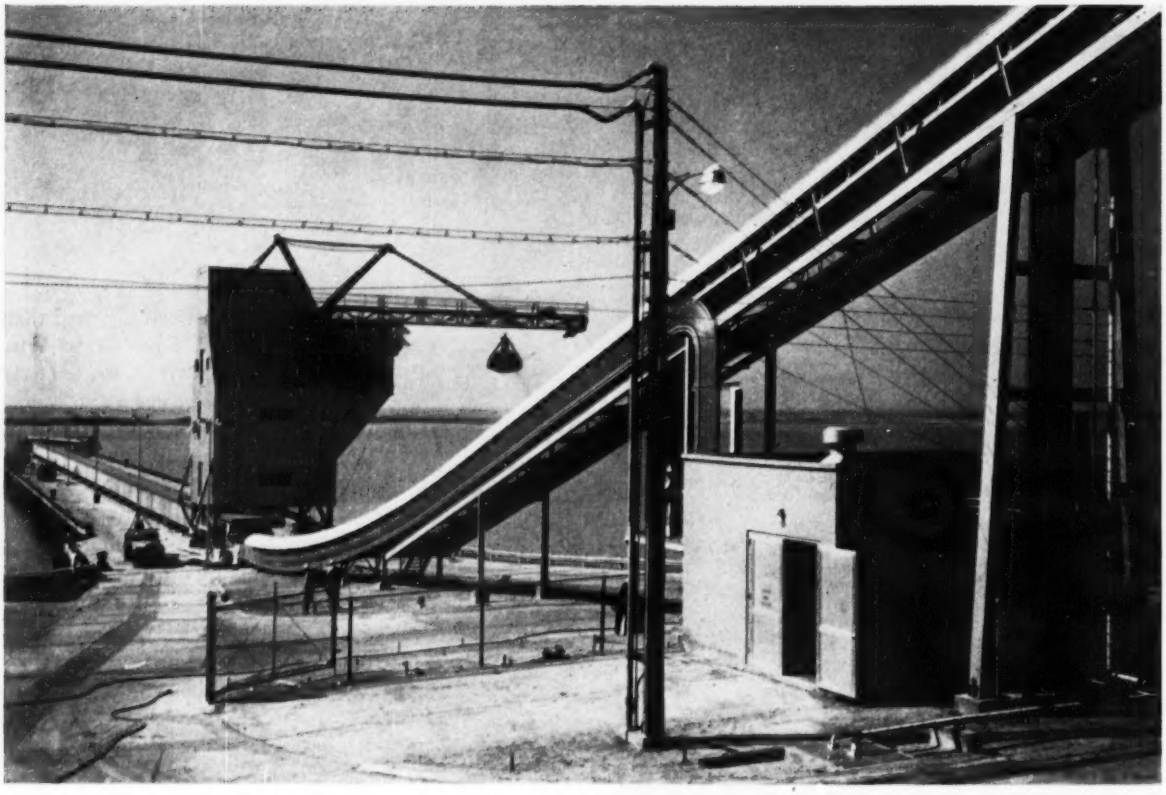


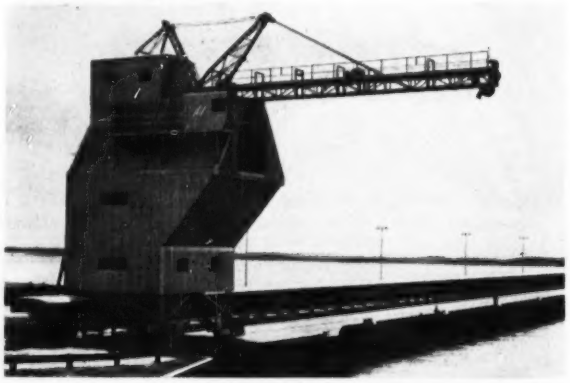
'Finger-Tip' Controlled Clyde Unloader Handles Bauxite Ore At Reynolds' Plant

A 'twist-of-the-wrist' or the push of a button is all that is required to control operations of this modern Clyde Unloader. Raise or lower bucket, trolley in or out, open or close bucket, raise or lower boom, travel entire Unloader . . . all accomplished with remarkable ease and accuracy.

Clyde Unloader machinery and controls are specially engineered with simplicity as the keynote to permit consistently fast operating cycles. Clyde's exclusive double trolley arrangement results in a horizontal bucket travel which also contributes to higher speed operation and lower power consumption.

The Model 14 Unloader has a free digging capacity of approximately 300 tons per hour. Boom length is 70 feet. Boom can be raised for shipping clearance.

Here, as at other installations, Clyde's engineering 'know-how' has helped to lower bulk material handling costs. Write in for full information and for a solution to your own problem.



At the Reynolds Metals Co., La Quinta Plant near Corpus Christi, Texas, this traveling Clyde Unloader is quickly positioned to unload Bauxite ore from ships to conveyor.

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THE CONSTRUCTION WEEK

- **Piers too near?**—The Port of Portland Commission isn't at all happy with plans of the Oregon-Washington Commission for a new Columbia River bridge that would parallel the existing structure between Portland and Vancouver, Wash.

  Reason: Columbia River pilots are dubious about navigating barge tows between two draw spans that would be 83 ft apart, if the new bridge is placed where engineers have penciled it in. Portland officials notified Army Engineers they want to be heard at any discussions of the new bridge plan.

- **New approach**—Construction men who have been following the various moves toward outlawing bid-shopping through separation of general and sub bids will do well to look at a new approach to the problem that is being tried in Georgia.

  Georgia subcontractors—concerned over getting work on the state's $200-million school construction program—appeared before the state school building authority to plead for the right to bid directly on work, without regard to the generals.

- **St. Lawrence—still battling**—Although there doesn't seem to be much chance of a reversal of the license granted New York State for construction of the St. Lawrence power project—the fight isn't quite over.

  Four groups that have opposed state construction or taken exception to features of the development, have filed demands that the Federal Power Commission withdraw the license granted in mid-June. The petitions are a necessary preliminary to any court review of the licensing order.

  Objectors include: Public Power and Water Corp., Trenton, N. J. (whose conflicting license application was denied by FPC on the ground that its proposal was not economically feasible); Central Pennsylvania Coal Producers Assn.; National St. Lawrence Project Conference; Lake Ontario Landowners and Beach Protective Assn.

  If FPC takes no action in 30 days, the petitions are automatically denied.

- **Who's got the taxes?**—There seems to be plenty of room for argument in that statement at the recent Governors' Conference, to the effect that the federal government should get its fingers out of the gasoline tax pie.

  Crux of the argument was contained in Gov. James Byrnes' (South Carolina) comment. He said, "The conditions that justified federal aid and federal control of highway construction no longer exist."

  While endorsing in principle the idea of self-reliance, many a highway expert comments that there's as much justification for federal participation now as there was 37 years ago—from the standpoint of defense and prosperity. And they fear the loss of the contribution of the Bureau of Public Roads, if federal efforts were to be suspended.

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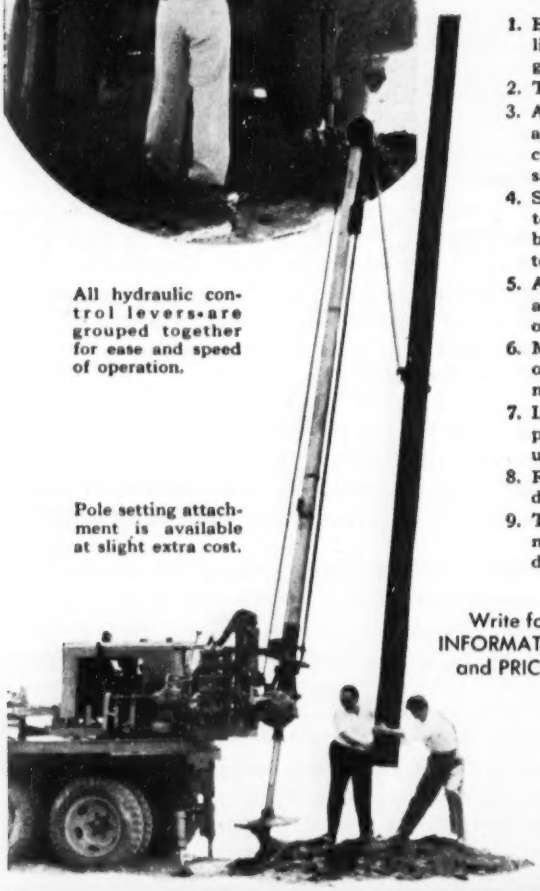
All hydraulic control levers are grouped together for ease and speed of operation.

Pole setting attachment is available at slight extra cost.



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For speed, dependable performance and economy of operation, Jaques Earth-Boring Machines will out-perform any on the market, no matter how tough the job or the soil. This machine is the result of 29 years of research, pioneering and experience in building earth augers. Note these features:

1. EASE of OPERATION — All operations hydraulically controlled with finger-tip control levers grouped together for ease and speed of operation.
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6. MOUNTING — Augers are skid-mounted with option of turntables or wiggletails, and may be mounted on any standard truck.
7. LOW CLEARANCE — Unit folds over truck to provide low clearance in transit. When not in use, unit can be removed from truck and stored.
8. REPLACEABLE PARTS — All parts are standard for easy replacement.
9. TWO MODELS — Choice of heavy duty model KJ-254 shown here, or extra-heavy duty model K-337.

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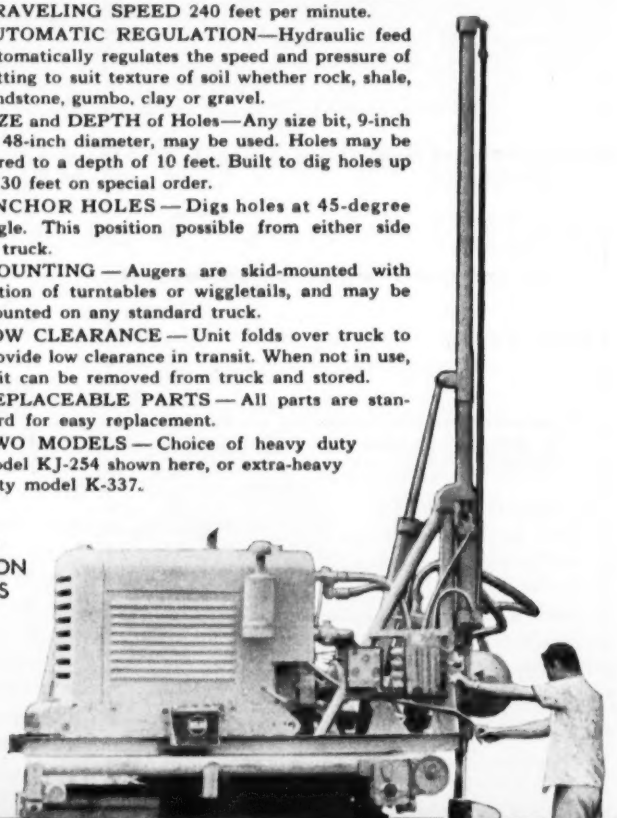

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BOX 298, DENISON, TEXAS

WASHINGTON OBSERVER

Lowered down payments on FHA houses before year's end is a good bet. The Administration is finding that home buyers are holding off because of lack of ready cash. This, with tightened credit policies invoked months ago, is partly responsible for the decline in housing starts.

Administrator Cole and other Eisenhower advisers are about decided that lowered down-payment requirements will offer a stimulant. The new housing law gives Eisenhower authority to lower percentages of total cost of houses as down-payment requirements.

•

Administration has fixed new rules for government-owned family housing. Hereafter, no government agency can build such housing if private housing could possibly do it. New order from Budget Director Dodge also fixes construction standards that must be followed.

Most important limitation is that floor area of any dwelling **must be held** with specified maximums spelled out for families of various sizes.

Biggest builders involved are military, Atomic Energy Commission, and the Interior Department.

•

Outlook for long-range supply of aluminum and aluminum plant expansion is up in the air. The Administration threw a shocker when it opposed the deal of Alcoa to bring in 600,000 tons of Canadian aluminum over a five-year period.

Alcoa figured U. S. users would need this metal in addition to U. S. production and other imports.

Getting new U. S. producers into the business now depends on government guarantee of bank loans. ODM has decided to hold off any decision for at least two months while the new Joint Chiefs of Staff come up with new estimate of military needs.

•

Just where the carpenters stand in the AFL Building Trades Dept., will clear up soon. The AFL has directed the building trades group, as well as AFL local and state councils, to suspend the carpenters because of their walkout from the AFL.

But the carpenters want to stay in the building trades, and continue in the National Joint Board for Settlement of Jurisdictional Disputes. Certainly there would be plenty of trouble if the carpenters made a clean break. Whatever steps are taken now against the carpenters will be reconsidered next month at St. Louis at the annual meeting of the AFL Building Trades Executive Council and the conventions of the Building Trades Dept., and the AFL proper.

Secretary of Commerce Weeks turned around on Astin case and the whole uproar that grew out of the controversial battery rejuvenator is about back where it started.

Dr. Astin is back as head man at the Bureau of Standards.

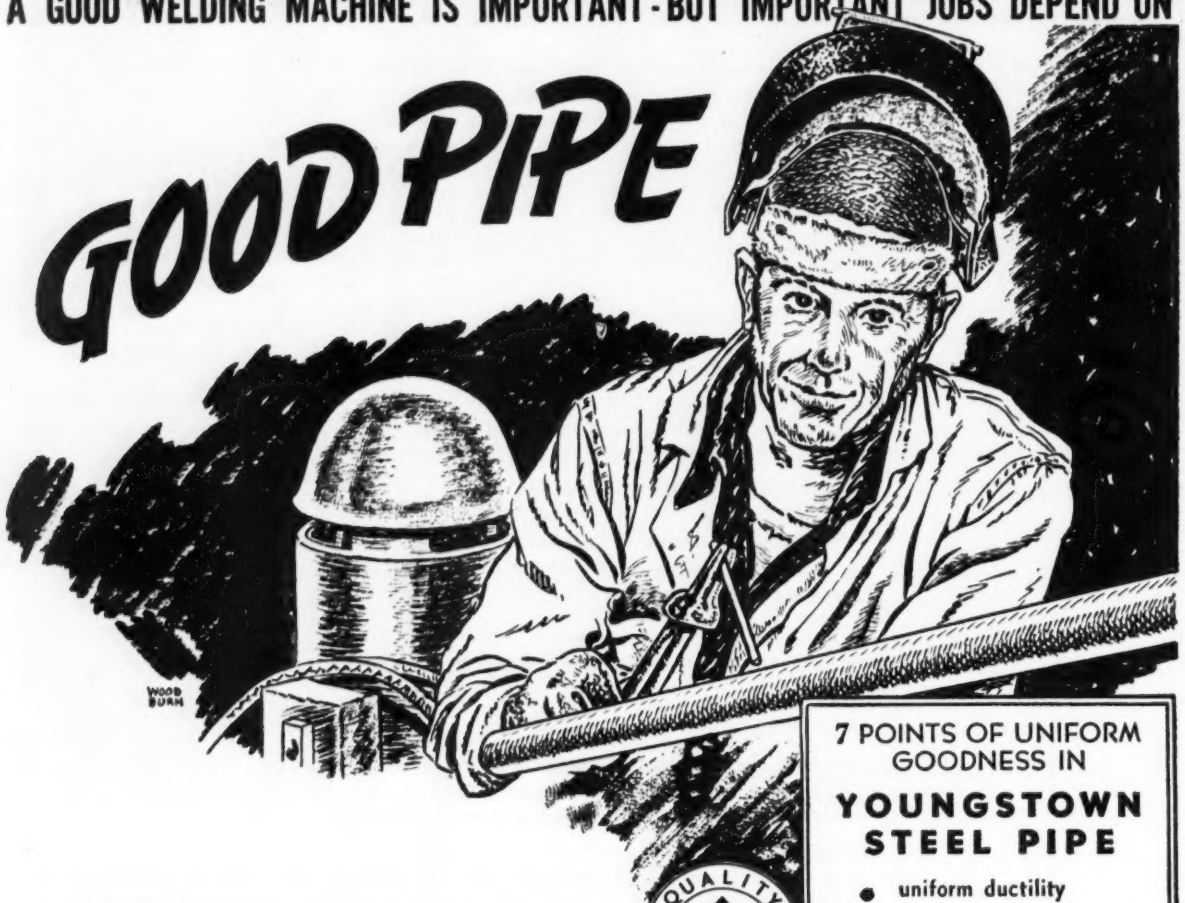
Jess Ritchie is out from under the Post-Office fraud order which had been issued against him.

Astin was going to top of list of names to head bureau which were being picked by committee of scientists at Weeks' request. So Weeks beat them to the gun.

Bureau scientists feel vindicated over the Weeks' action. Still hanging fire is report of another committee on validity of bureau's testing of battery additives. But feeling is that the bureau will come out all right on this, too.

A GOOD WELDING MACHINE IS IMPORTANT - BUT IMPORTANT JOBS DEPEND ON

GOOD PIPE



NO matter how intricate the weld, you do it readily with Youngstown pipe.

That's because Youngstown pipe is designed and made for easy welding—truly round, uniform in wall thickness, uniformly sized, and chemically and metallurgically right. The name "Youngstown" rolled into a length of pipe means it is GOOD PIPE.

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Military installation control spelled out by Defense chief

Secretary delegates wide responsibility—but less executive power—to new property and installation chief. But there's no question about who's boss on military construction

Defense Secretary Charles E. Wilson has given wider responsibility—but less executive power—to Franklin G. Floete as Assistant Secretary for Properties and Installations than were assigned last year to Frank R. Creedon. But there is no doubt at all that Floete is the boss when it comes to military construction.

Under terms of a directive issued by Wilson this week, Floete (a retired Des Moines, Iowa, businessman who once headed a major Midwest construction firm, as reported in ENR July 30, p. 22) has two duties:

• Giving advice and assistance to the Secretary of Defense and his staff on matters relating to property and installations.

• Developing policies and procedures for the department . . . in the broad fields of real estate acquisition, utilization and disposal; construction; property management and maintenance, and housing.

Specifically included under this last are industrial production facilities, lands, housing, buildings, ports and bases, plus "all other installations that may come under the department's supervision."

The Assistant Secretary's duties, thus, will cover every factor affecting real property of the three armed services from first inception to final disposal or replacement of structures.

• **Executive power withheld**—Wilson's director, however, carefully does not give Floete personal authority to take executive action on the scale that was delegated to the now-superseded Creedon as Director of Installations. Floete is told only to initiate whatever action is necessary to insure development of sound construction programs—and development of adequate information to substantiate such programs.

The power to issue directives to the military services is carefully reserved to the Secretary himself.

Actually, the question of executive authority is academic: Creedon was too skilled a public servant ever to shake a big stick, got good cooperation from the services. Floete will get the same—so long as Wilson stands solidly behind him.

• **Action indicated**—Floete is expected to move fast on one item where his predecessor marked time: the development of uniform criteria and construction standards for the services.

Creedon's staff worked up uniform criteria for barracks and bachelor officers' quarters, for instance. Now the new man can recommend that they be used. All of these standards are on a performance or functional basis, allowing free choice of materials and construction methods, within prescribed performance limits.

• **Public works**—On public works construction programs, Floete is directed first to give the military departments basic instructions and planning assumptions to follow in drawing up their schedules and budget requests. Second, he is to study and pull together the construction programs. Finally, he will recommend the screened programs for adoption by the Secretary of Defense.

Wide World photo

F. G. FLOETE—He's boss of military installations.

And, after Congress has authorized the program and voted money, the Assistant Secretary will decide for Wilson what jobs should get money to go ahead; and which should be rescheduled.

Family housing, too, comes completely under the new Assistant Secretary—where Creedon had only an indirect say.

And Floete has one other grant of authority: He is authorized to obtain from the military such reports and information as he needs to carry out his responsibilities.

OK 600-mi. Alaska-Canada pipeline

Alaska military establishments will get a protected supply line for aircraft and transport fuel, and machinery and utility oil needs with construction of a 610-mi., 8-in. pipeline from Haines, southeastern Inside Passage port, to Fairbanks, in the heart of central Alaska. Bids will be called by Corps of Engineers in a month.

Completion of negotiations between U.S. and Canada to allow the line to cross 284 mi. of the dominion, marked announcement of the project.

The Engineers hope to push the work as rapidly as possible for completion in a year. But sub-arctic conditions in most of the terrain may limit work this fall to delivery of materials. Most of the pipeline will parallel existing routes of the Alcan Highway south from Fairbanks and the Haines cut-off route north to a junction with the war-built Alcan.

Along the Canadian portion the pipe will be laid underwater through nine miles of Lake Kluane. Four pumping stations will be required to boost the fuels over the mountains north of Haines.

The Corps estimates cost at $40 million, including pumping units and terminal and storage facilities at either end and at military bases along the route.

Engineering problems involved in laying the 8-in. line over permafrost are unprecedented, according to the Engineers' announcement. Some $12 million of the total cost will be spent on facilities in Canadian territory.

U.S. names areas for 20,000 homes

Public Housing Authority divides authorization for low-rent projects to start within fiscal year

U. S. Public Housing Commissioner Charles E. Slusser this week named the local housing authorities that will be authorized to place 20,000 new low-rent homes under construction between now and June 30, 1954.

Congress, in the Appropriation Act for 1954, imposed the 20,000 limitation on new low-rent homes to be started this year by local housing authorities. Since PHA had contracts with local housing authorities covering 55,946 low-rent homes (ENR Aug. 13, p. 27), it had to ration the 20,000 homes on a nation-wide basis among the localities holding contracts.

The list is final except for those places where a local housing authority finds itself unable to start construction. When that happens, PHA will substitute other projects from the backlog.

• **Criteria**—In selecting projects, Slusser said the first objective was to salvage those projects in which the local and federal governments had the heaviest financial investments. Second, PHA considered these factors:

• Projects that had gone out for bids prior to July 1, 1953, had produced favorable bids, but had not been authorized for construction because of the 35,000 limitation in existence last year.

• Projects that had no problems of local litigation and no unusual difficulties of land acquisition or land clearance.

Wide World photo

Charles E. Slusser

• Projects that represented the first low-rent housing in the locality, with due regard for the need for such housing.

• Projects closely related to slum clearance and urban development programs, where low-income families displaced from areas to be cleared must be provided with homes within their means.

• Projects which, when built, will achieve and equitable distribution of low-rent homes among racial groups.

• **Locations**—Here are the localities that will be able to start public housing projects this year:

Alabama—Hartselle; California—Los Angeles, Richmond, San Francisco, and the Housing Authority of San Bernardino County for Colton; Colorado—Denver; Connecticut—Ansonia, New Haven; Florida—Miami; Georgia—Athens, Atlanta; Illinois—Chicago, Housing Authority of Calhoun County for Brussels, Hardin, Hamburg, Kempsville, H. A. of Perry County for Pinckneyville; Indiana—Evansville, Muncie; Kentucky—Somerset; Louisiana—New Orleans;

Maryland—Baltimore; Michigan—Detroit, Saginaw; Missouri—St. Louis; New Jersey—Newark; New York—Buffalo, New York, Syracuse; North Carolina—Goldsboro, Rocky Mount, Winston-Salem; Ohio—Cincinnati, Youngstown; Oregon—H. A. of Douglas County for Reedsport;

Pennsylvania—Monessen, Connellsville, Philadelphia; Tennessee—Etowah; Texas—Beaumont, Galveston, Knox City, Texarkana; Virginia—Norfolk, Portsmouth; District of Columbia; Puerto Rico, San Juan.

See easing of Reclamation design policy

New chief engineer outlines policy of "farming out" engineering work where possible to save money, improve planning

Private consulting engineers were assured this week that they will get Bureau of Reclamation engineering contracts—and without competitive bidding—within the money limitations imposed by Congress, wherever private services can save the government money or improve the soundness of bureau planning.

The assurance came from Wilbur A. Dexheimer, newly appointed (ENR July 16, p. 21) Commissioner of Reclamation. It was contained in a letter to Sen. Edward J. Thye of Minnesota, chairman of the Senate's Small Business Committee. Thye had received a letter, suggesting a better break on bureau business for private engineers, from Waldo L. Scott of Fort Worth, who heads consulting firms in Texas and South Dakota.

• **Complaint**—Scott spoke of steady encroachment of the Reclamation Bureau and the Army Corps of Engineers on fields of activity formerly serviced by private consulting engineers and architects. The bureau, he said, had avoided use of private firms and had required competitive bidding for the few engineering jobs that were given out. Scott said he personally had witnessed award of contracts to the lowest bidders for engineering services on Reclamation transmission lines in the North Central States at prices that resulted in substandard work. He also asserted that the government agencies had furnished free of charge, to municipalities in the Dakotas, plans and specifications for municipal utilities and public improvements.

Scott suggested that the new Administration: (1) Take the government out of competition with private business, (2) confine the engineering and architectural functions of government agencies to the establishing of overall standards against which they would check and approve detail plans and specifications submitted by private firms, and (3) set up fair working fees for employment of private firms and eliminate entirely competitive bidding for professional services.

• **Answer**—Dexheimer commented on these suggestions from his background as both a private consultant and a bureau engineer: Reclamation was compelled to build up its own engineering organization to handle big projects like Hoover, and Ground Coulee, he pointed out; no private engineering firm could assume such large responsibilities. This was equivalent to assembling many consulting engineers in one unit, and proved most economical.

Dexheimer further said that the bureau has utilized individual consultants frequently as shown by congressional appropriation hearings this year. (It was largely the protests of Interior Department engineer officials that persuaded Congress to raise the maximum fee for private consultants from $50 to $100 a day.)

Federal power role to start decline, power policy statement affirms

Declaration of objectives points to states, non-federal agencies as having growing role in production

Designers and builders in the years ahead (or at least as long as the Republicans run the show in Washington) will be getting more and more electric power jobs from non-federal owners, fewer and fewer from federal agencies. That's the meaning of the newly enunciated power policy of the Interior Department.

How big the shift may be is anybody's guess. But the change is already under way, it was clear in Undersecretary Ralph Tudor's statements explaining the new power policy. Gist of what Tudor said (in the absence of his vacationing boss, Secretary Douglas McKay) was this:

Even the colossus that the federal government has become can't match the construction of electric capacity to meet skyrocketing demands. But if local public and private interests can be encouraged to carry more of the load, quicker build-up, less cost to the consumer and less burden on the federal government may be expected to be achieved.

ENR photo by Compton

RALPH TUDOR—He spells out new policy on federal construction.

• **Cheers—and a reversal**—The power statement—which represents a not unexpected, but quite complete reversal of policy in past years—"has found wide acceptance" in all sections of the country but one, according to Assistant Interior Secretary Fred G. Andahl. The one exception is the Pacific Northwest, where the huge Bonneville and Grand Coulee projects have been supplying the bulk of power for the area.

Generally, private utility interests and many others who have publicly decried the growing control of the government in the vital power field, greeted the announcement happily.

Just how big a reversal could be is obvious in these figures:

In the last 15 years, federally owned generating capacity increased 1,000% while privately owned utilities stepped up their capacity 100% and local public bodies enlarged their generating facilities by 150%. In 1953, federal plants were producing 13% of the nation's power, as compared with 1% when the Democrats took over in 1933. Interior this year has some $63 million to be spent on electrical development or transmission.

• **The policy**—The plan Tudor enunciated (endorsed from Denver by President Eisenhower) blocks out the specific policy for federal power programs, and specifies a number of departures from that of the last few years.

"The primary responsibilities of the (Interior) Department," said the statement, "are the reclamation of arid and semi-arid lands under the federal reclamation laws, and the development of natural resources as authorized by Congress. These responsibilities include the disposal of surplus electrical energy which can be economically produced in the course of development of these resources.

"The department . . . will . . . actively plan and recommend construction of generating facilities in hydro projects under its jurisdiction, when such facilities are economically justified and feasible. The department will particularly emphasize those projects which . . . are beyond the means of local public or private enterprise.

"It is recognized that the primary responsibility for supplying power needs of an area rests with the people locally. The responsibility of the department . . . is to give leadership and assistance. . . .

"The department does not assume that it has the exclusive right or responsibility for . . . electric energy in any . . . region. In general, it will not oppose construction of facilities which local interests . . . are willing and able to provide, in accordance with licenses and other controls of the . . . appropriate regulatory bodies."

"If reclamation costs are assigned to power, rates for power shall be such as to recover these additional costs within a reasonable time."

• **Not a withdrawal**—The statement definitely doesn't mean that the federal government is going to withdraw from the construction of power plants and transmission lines: It still will build facilities where federal responsibilities call for them, or where local interests fail to meet regional needs.

Tudor made it clear that the Administration considers the policy no quick panacea for all of the department's power problems. But Interior obviously believes that encouragement of other than federal interest will go a long way in easing those problems.

Drop foreign bidders for Bonneville

Bonneville Power Administration has thrown out two low bids by foreign firms for reason of lack of experience and awarded Allis-Chalmers Manufacturing Co., Milwaukee, Wis., a $2,005,378 contract for two banks of 345,000-v autotransformers which BPA reports may be the world's highest capacity units of their type.

Low bidder was American Elin Corp., Austria, at $1,375,550 and second was Ferranti Electric, Ltd., England, at $1,527,400.

A Bonneville announcement explained the foreign bidders "did not meet the specifications with respect to experience in the field of very high voltage and large capacity equipment." And added:

"It has been determined that neither of these foreign firms has had, up to this time, any experience in autotransformers of this size and voltage class. American firms have had four or five years of test and design experience, including construction of a unit that has been under design, construction and test for over two years."

The two banks will be used on the 345-kv transmission line to deliver energy from McNary Dam, now nearing completion, and the Portland area.

While turning down the British and Austrian firms, BPA announced Interior approval of a $300,000 offer of Nippon Gaishi Kaisha, Ltd., Nagoya, Japan, for 100,000 units of high-voltage suspension insulators. The Japanese firm's product has successfully passed electrical and mechanical tests—part of specifications. Lowest domestic bidder offered $408,000, less $50,000 freight allowance.

Unbuilt planes block Bay bridge

Navy's sudden expansion of seadrome blocks one proposed route for new San Francisco Bay crossing

Jet seaplanes not yet in production apparently have ruled out the Army Street-Bay Farm Island site for a second San Francisco Bay crossing that was specified by state legislative action in June.

This startling revelation was made by Navy officials Aug. 17 at a Corps of Engineers hearing on California's application for a permit to build the crossing over the navigable waters of the bay.

Seadrome lanes for the nearby Alameda Naval Air Station that are now 9,000 ft long must be extended to 15,000 ft for use by jet seaplanes, a statement by Twelfth Naval District Commandant Rear Adm. B. J. Rodgers declared. That means the lanes would lie across the projected Army St.-Bay Farm Island bridge route.

The Navy statement, submitted at the hearing by District Civil Engineer Capt. G. Brodie, pointed out that possibilities of other sites for seaplane operations in the bay area have been investigated and relocation of any major seadrome is impracticable. It further noted that Alameda Naval Air Station could not be duplicated for less than $150 million.

The Navy asked that no part of any crossing be located within 1,500 ft. of the end of any runway either at Alameda Naval Air Station, the Oakland Municipal Airport or the seadrome. And that no part of any crossing should extend within the 50-1 glide angle originating 1,000 ft from the end of any runway or seadrome.

Stunned and angered by the surprise report, San Francisco officials—who have supported the Army Street site—put Capt. Brodie under sharp cross-examination.

Questioning brought out the fact that local Navy officers had learned of expanded seadrome requirements from Washington only 10 days earlier, and that the new seadrome was designed only the week before.

It now appears that if a southern crossing is to be built, it will have to be located at the Candlestick Point-Bay Farm site.

The Navy may well have additional comments concerning the Candlestick Point crossing that may adversely affect it. It is almost certain that such a crossing cannot be in a straight line as sketched in on most maps. It must bow southward to permit clearance of the San Francisco Naval Shipyard at Hunters Point and to permit the main ship channel to cross under it at a right angle.

Fight bridge plan for Puget Sound

Crossing of Puget Sound west of Seattle with any type of floating bridge was vigorously opposed by shipping interests of the area at a public hearing held in Seattle by the Corps of Engineers.

Representatives of the ports of Seattle, Tacoma and Olympia, and industries in two of the three cities argued that such a bridge would block 90% of the east channel between the Seattle mainland and Vashon Island and would be in effect a surface breakwater that would be dangerous. The structure, sponsored by the Washington Toll Bridge Authority in a drive sparked by the authority's chief engineer, Charles Andrew (ENR Aug. 20, p. 101) would cost at least $100 million, and would eliminate present ferry connections with the cities from Seattle areas.

Mr. Andrew conceded at the hearing that any structure would be a detriment to navigation but said he doubted that the proposed crossing would jeopardize shipping interests. He commented that he had conferred with the Puget Sound Pilots Assn., and found that an overwhelming majority of its members thought that the proposed two 500-ft horizontal openings would be adequate.

• **Push Hood Canal bridge**—While shipping and business interests argued the suitability of the crossing, the Toll Bridge Authority pushed hard for another structure in the area—a bridge over Hood Canal.

Hood Canal is a relatively narrow body of salt water which extends south some 50 mi from the northern reaches of Puget Sound, effectively separating the extreme northwest portion of the state from most of the rest of western Washington. It is crossed at present only by a ferry. The proposed bridge would have a 6,200-ft section of floating concrete pontoons and would rise a maximum of 17 ft with the tides. One approach would be a 280-ft span over the water, with 35 ft of vertical clearance, while the other would have three spans over a distance of 1,780 ft with vertical clearances up to 215 ft.

Court ruling clears way for Raritan sewer work

A ruling by the New Jersey Superior Court last week apparently had cleared the way for construction of the long-projected $22.5-million Raritan Valley trunk sewer.

The court dismissed a suit brought by a former mayor of the city of New Brunswick that would have blocked construction of the sewer on the ground that New Brunswick's participation in a cooperative move to build the sewer was illegal.

The city was the last of twelve municipalities and seven industrial concerns to join the compact, which looks toward clearing the Raritan River of pollution. The former mayor, Frederick Richardson, had attacked the constitutionality of the state's Sewage Authorities Act and the city's action in joining the compact.

Cool to pike link

N. C.-W. Va. link is 'last resort,' says Virginia

Virginia highway officials have made it clear to neighboring North Carolina and West Virginia that their state would consider a toll road to link the two other states only as a last resort.

Highway officials of the three states met in Richmond to consider the possibility of a toll pike in southwest Virginia, to carry traffic from West Virginia's projected toll highway across the western end of Virginia into North Carolina. The West Virginia road would extend from Charleston to Princeton—on the Virginia border. North Carolina is considering a toll road from Mt. Airy (near the Virginia line) south through Winston-Salem and Charlotte. About 70 mi of Virginia territory would separate the two roads.

• **Look first, build later**—But Virginia officials were understood to have set forth their state's position this way:

Virginia's thinking on toll roads hasn't been resolved into anything definite—but at the moment it favors free roads. For this reason, Virginia would attempt to handle any new traffic generated by the two toll highways by improving existing free roads.

Meanwhile, state officials agreed to employ the New York consulting firm of Coverdale and Colpitts to make a detailed study of future highway needs along the projected route of the western toll road.

Tunnel bids are in

Chicago filtration plant lines will serve $85-million, 950-mgd installation

Tunnel contractors converged on Chicago last week seeking one or more of three multi-million-dollar water-tunnel contracts that were being offered by the city. However, one contractor outbid all competition when he submitted the lowest bid on all three of the contracts.

The construction includes six miles of large-diameter tunnels to serve the $85-million, 950-mgd filtration plant to be built on "made" fill in Lake Michigan just north of Navy Pier (ENR June 19, 1952, p. 52). The Santucci Construction Co., Chicago, was the low bidder, with a total bid of $14.8 million for the entire six miles of tunnels. The second lowest bid was $19.3 million.

There are three major tunnels in the project—all to be of the so-called Chicago section, which is horseshoe-shaped in design. One tunnel, 20 ft in width and height and 1,400 ft long, will bring raw water to the plant from existing intake cribs. The other two will be 16-ft tunnels, carrying treated and filtrated water to the city's pumping system. One 2,080-ft line will connect with the Chicago Ave. tunnel, and a 28,200-ft line will extend north to the Wilson Ave. tunnel. Both tunnels will be driven in rock, from 180 to 220 ft below ground level.

This tunnel work is the second phase of construction in connection with the filtration plant project. Construction was started last summer on a $6.6-million cofferdam contract that will enclose the 61-acre site for the new plant.

Property owners near the lake shore on the near north side are fighting the proposed location of the plant (ENR July 17, 1952, p. 68) but a circuit court ruling is expected soon in the case. The project is being designed and constructed by Chicago's Department of Public Works, Bureau of Engineering.

F. E. Schmitt retires from Reclamation post

Frederick E. Schmitt, for nearly 10 years assistant to the chief engineer of the Bureau of Reclamation, a former editor-in-chief of ENGINEERING NEWS-RECORD, retired from his Reclamation post recently.

Mr. Schmitt was editor-in-chief of ENR from 1928-1940, and previous to holding the top post on the magazine was a long-time staff member both of ENR and one of its predecessors—Engineering News. During his long service with the publications he was responsible for many editorial innovations and a number of outstanding contributions to the engineering profession—including his accurate and complete reporting on the collapse of the Quebec Bridge in 1907.

He joined the bureau upon his retirement in 1940, and became assistant to the chief engineer in 1945, assisting the bureau's engineering chief in all phases of its engineering operations.

Concrete moves again at Folsom Dam

With a truck haul serving as a temporary expedient (until washed-out pouring trestle can be replaced) concreting is again under way at Folsom Dam, Calif. Crane loads four-yard bucket on truck (above) for haul to operations site (below) where smaller crane delivers bucket to workers.

Contractors (Merritt, Chapman & Scott and Savin Construction Corp.) are rushing the repair of a trestle lost in a cofferdam washout and partially removed to permit excavation of defective material in a fault zone. (Details on Folsom Dam work appeared in ENR July 23, p. 39.)

ENR and Sacramento Bee photos

Rush work on three western dams

McNary power due Dec. 1; top out main block at Canyon Ferry; Atkinson low on San Francisco bid

With an eye to the area's growing power and water shortage, the Pacific Northwest pushed fast to complete three major projects.

Of greatest importance to the power picture was an announcement that a new construction schedule at McNary Dam on the Columbia River will put initial power on the line there by Dec. 1. Near Helena, Mont., workmen topped out the final main block of $28.8-million Canyon Ferry Dam. And at San Francisco, a low bidder was announced on $13-million Cherry Valley Dam—a structure being built under an unusual federal-local agreement.

• **McNary power**—Corps of Engineers officials—who originally had planned an earlier date (but were held up by a tardy Columbia River runoff peak)—planned ceremonies for Dec. 1 to put McNary Dam's Units 1 and 2 on the line officially as a part of the Pacific Northwest power pool.

Col. F. S. Tandy, Walla Walla district engineer in charge of the $300-million structure, outlined a 13-step plan to bring power in on time. Step 1 (on Aug. 31) will be to close navigation locks for two months while upstream navigation channel sill blocks are raised to 320-ft level. Other steps will include: placing forms, concrete pouring, placing stop logs, and slowly building up the reservoir pool behind the dam to reach its maximum 335-340 ft near the end of the year. Last step—a 30-day period after Nov. 1—will be testing generators.

• **Canyon Ferry**—Crews for Canyon Constructors have topped off the main block for the dam, as construction of the huge multi-purpose project on the Missouri River came close to another milestone. The dam is already serving part of its purpose: control of Missouri River flow, with a reservoir already about 15 mi long.

The 50,000-kw powerhouse at the dam is near completion, with first generator scheduled to go on the line this year. Spillway gates are being installed, and work is in progress on completion of the main dam and the roadway that will cross the top of the structure.

• **Cherry Valley**—Low bidder on all three alternates for San Francisco's $13-million water supply project was the Guy F. Atkinson Co., which offered a price of $7.163 million for spillway excavation and construction of the dam to full height. The bid was about $1 million lower than the city had expected. Alternates calling for construction of the dam to a lower height and exclusive of spillway excavation had been offered in case the city couldn't afford to pay for the dam as originally designed.

The project will increase by 270,000 acre-ft the storage facilities for the city's Hetch-Hetchy water and power system and provide flood control for the Tuolomne River, since the earth- and rock-fill structure will be located on Cherry River—a major tributary of the Tuolomne.

The dam is the first project to be built under a unique federal-local arrangement, whereby the city, the Modesto and Turlock Irrigation Districts, and the Corps of Engineers cooperate. The 1949 agreement is aimed at cutting costs, hurrying construction and to increase operating efficiency on the Tuolomne by combining flood control, power and water supply in single facilities, instead of over-lapping ones.

The project will make it possible for San Francisco to maintain the Tuolomne stream flow for the irrigation districts.

News briefs . . .

• **Road decisions**—Delaware's State Higiway Commission has approved in principle a highway interchange at the Basin Road DuPont Parkway intersection near Wilmington, and a $1-million interchange at Naaman's on the Philadelphia Turnpike. Approvals may make possible rearrangement of priorities of highway construction projects in the next two years by removing bottlenecks and permitting longer-range planning of other roads.

• **Low bid sets high**—The low bid submitted last week for improvement in the north approach to the Golden Gate Bridge established the project as the most expensive single highway project undertaken by California. Guy F. Atkinson Co., San Francisco, was low at $4,122,382 on a job involving converting the existing four-lane road to a six-lane divided freeway for a distance of four miles.

• **OK hospital program**—A $20.2-million construction program to improve Virginia's hospitals for mental patients has been approved by the state hospital board.

Photo by Sterne

Ernest E. Howard dies, was ASCE president

Ernest E. Howard, 73, senior partner of the Kansas City engineering firm of Howard, Needles, Tammen and Bergendoff and president of the American Society of Civil Engineers in 1950, died at Kansas City, Mo., last week.

Widely known for his business and civic activities, Mr. Howard was, among other things, chairman of the board of trustees of the University of Kansas City, and inventor who held several patents relating to movable bridges, author of numerous papers on both engineering science and on the engineer's place in society.

Born in Toronto, Ont., Mr. Howard moved with his family to Jacksboro, Tex., and was graduated in 1900 from the University of Texas, with an engineering degree. He served as an instructor in civil engineering at Texas for one year, then joined the firm of Waddel & Hedrick—headed by the late J. A. L. Waddell, with whom he remained through a number of associations until 1914. He became a member of the consulting firm of Harrington, Howard, Ash in 1914, and in 1941 the present firm of Howard, Needles, Tammen and Bergendoff was formed.

Throughout his long career, he specialized in bridge design, although his firms did much other more general engineering work. His work took him to many parts of the world before and after World War II, and during the war itself he was engaged in a number of special projects for the War Department.

Always interested in professional society matters, he headed the Kansas City Engineers Club in 1921; the Kansas City Chapter of ASCE in 1926; and was elected to head the ASCE itself in 1950.

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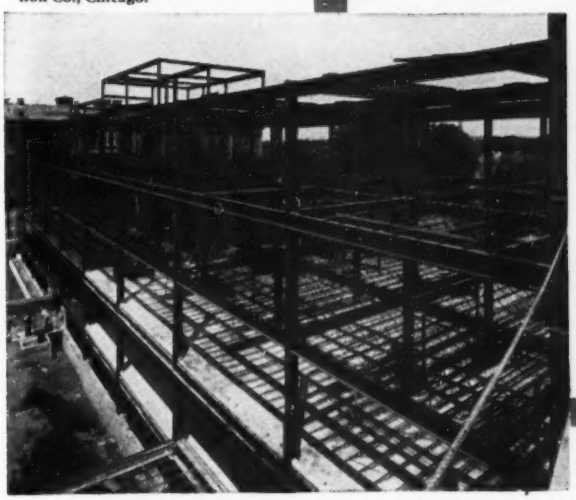

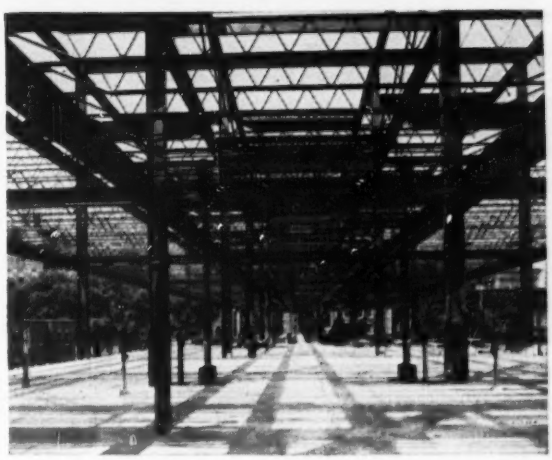

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IDLE TRUCKS Concrete-starved construction projects shut down in drivers' strike.

IDLE OFFICE Boredom marks days in ready-mix plant. Building tradesmen weren't so lucky.

New York truck strike: the inside story

By George T. Orick
Assistant Editor

There was one big question in the minds of more than 100,000 New York area construction workers—and their families—this week. Why don't the truckers go back to work?

They were referring to the thousand-odd members of Local 282 of the International Brotherhood of Teamsters who, after eight weeks, were still at odds with their employers—sand and gravel suppliers, building materials merchants and ready-mix concrete vendors.

And the construction men have had plenty of time to think about the strike, for they have been out of work for about six weeks, as a result of the closing down of over half a billion dollars' worth of construction projects due to lack of materials.

• **Slow reaction**—The public, unaware of the strike's impact started to wonder. There were little symptoms: a purse-snatcher said he was a striking truck driver who needed money for food; holes in the city's streets, dug for repairing understreet facilities, were left open because there was no concrete or asphalt to fill them; families who had given up apartment leases to coincide with completion of homes stared helplessly at unfilled footing trenches.

Scheduling of construction—always a tricky matter in New York—was disrupted. The two best building months were lost, and no one seemed able to do anything about it. Nobody, that is, except the strikers and their employers.

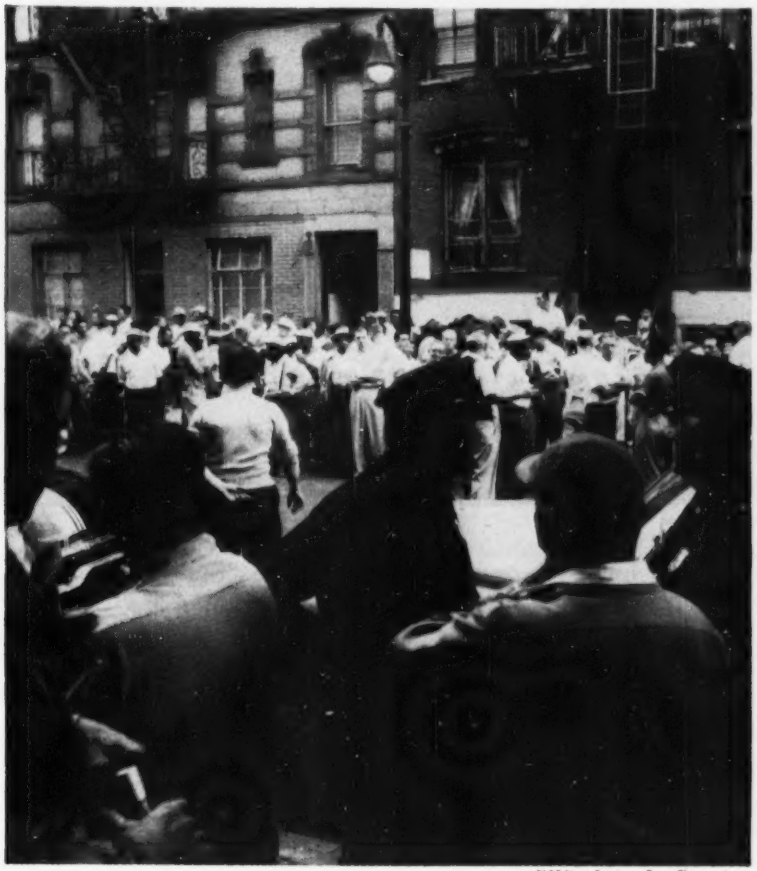
The Building Trades Council and the Building Trades Employers Assn., which have for years talked out construction labor disputes to keep them from becoming strikes, were stymied. A special committee, appointed by New York's mayor, appeared unable to bring about an agreement.

And on two occasions the rank and file of Local 282 whisked control of meetings from their president, refusing to accept terms he had brought back from the bargaining table.

Let's take a look at Local 282 and its relationship in the New York scene, and its president, John O'Rourke.

• **History lesson**—In 1946 some 1,000 general drivers who were members of Local 282 joined a city-wide truck strike. The local paid them $35 a week in strike benefits, as against $10 a week paid by other locals that had drivers on strike.

Today, the striking building material drivers of Local 282 are given no



ENR photos by Compton.

IDLE WORKERS Rank and file of drivers' local, balking at president's control, refuses pay offer he negotiated.

strike benefits, and many of them are resentful. They feel the local's treasury, made up partly of their dues, was unnecessarily weakened in 1946. There are no general drivers in O'Rourke's local now: they were pulled out a few months ago with the aid of Dave Beck, international president of the teamsters.

This leaves the building materials drivers the dominant group in Local 282.

There may be other reasons for their resentment, too. Earlier this week, Robert B. Blaikie, an insurgent seeking the Democratic nomination for mayor, charged that O'Rourke is working hand-in-glove with William McCormack, reported fountainhead of power along the New York waterfront and president of Transit-Mix Concrete Corp., a big employer of Local 282 drivers.

Blaikie, who theorized that settlement of the strike is being delayed until just before the Democratic primaries in mid-September for the benefit of the incumbent Mayor Vincent Impelliteri, said he had uncovered business links between O'Rourke's family and employers of Local 282 drivers.

At any rate, it is no secret that a fierce battle is going on within Local 282. O'Rourke has all but lost control of his membership to Andrew Duffy, secretary-treasurer, who has become a champion of the rank and file. Result has been that any settlement suggestion made by O'Rourke and the employers has been repudiated by most of the membership.

Dave Beck, the nation's boss teamster, has called for a vote in the strike. It is known that he has little love for O'Rourke, and there is a strong suspicion in the minds of insiders that he was watching the power struggle within Local 282 with something more than dispassionate curiosity.

Beck's intervention has been sought from many angles. The New York Building Trades Council, among other groups, has made many appeals for his help.

• **Anatomy lesson**—Local 282 is said to be top-heavy with paid officials. There are about 15, including 10 field delegates—at about $240 per week—to look after the affairs of some 6,000 to 7,000 members. Other New York locals—with as many as 10,000 drivers—are run by eight or nine paid officials.

A couple of delegates of Local 282, representing Long Island drivers, made an effort recently to secure a charter from the Washington headquarters of the teamsters for a separate local on Long Island.

The move was ultimately killed, and the delegates who were involved were ousted.

And that's not all. The members of Local 282 are paid less than construction laborers. Under their three-year-old contract, the drivers were paid $2 an hour, and their take-home pay averaged about $70 a week. Many of them feel their elected leaders have failed to win them pay increases comparable to those of other workers of similar skills.

As of press-time they were still holding out for a half-dollar hourly increase, and employers were clinging to a 40-cent offer. The dime that separates them is more symbolic than real, in the opinion of many qualified observers.

Over 50 of the smaller employers have settled on the drivers' terms, but some of them have been unable to resume operations because of a shortage of sand and gravel, shipped to them by barge. There have been reports of pressure on the smaller operators to stay shut down until their bigger competitors have agreed on terms.

Agreement at Joppa

International leaders of AFL building trades unions swept through Paducah, Ky., and Joppa, Ill., negotiating job-wide agreements, embodying "no-strike" clauses, designed to halt jurisdictional strikes which have harassed contractors building two major atomic energy installations. At Joppa they signed a pact with Bechtel Corp., new contractor for the behind-schedule power plant (ENR Aug. 13, p. 21). At Paducah they whipped into final shape a job-wide agreement for AEC's $1-billion factory.

Aftermath in Morocco — Good airbases

Waldo G. Bowman
Editor, Engineering News-Record

When the complex of five airbases now under development in French Morocco is completed it will be one of the best and most efficient such setups anywhere in the world, including the United States.

Its total cost to the American taxpayers—including the repair of substandard portions of the runways and aprons on two of the bases—will be no greater than was originally estimated.

As a construction achievement, the Moroccan work will rate with the best we have been able to do in a foreign country, both as to procedures and facilities.

And the work will be noted for interesting and unusual pavement construction, for steel hangars of special design, prefabricated concrete warehouses, and for a multiplicity of other structures and services.

How can all this be when within the year there were widespread charges that the Moroccan program was ill-conceived, wasteful, inefficient, a failure and a fiasco?

There are three main reasons: (1) The charges of waste and poor construction were grossly exaggerated: (2) the initial construction was measured against peacetime standards instead of being regarded as a consequence of rush operations engendered by the fear that the Korean war would spread to Europe: and (3) the program has now passed beyond the difficult initial period into one where organization, material supply and construction methods are no longer disordered, but are operating according to plan. Indeed it was possible for the contractor, late last month, to replace the cost-plus-a-fixed-fee contract with one of guaranteed-maximum-price type in which $32,400,000 was set as the cost of completing the three bases now under way.

That the original charges were exaggerated and put forward without benefit of the proper emergency perspective is clear from reading the second report, dated Feb. 19, 1953, of the Senate Preparedness Investigating Subcommittee, which reversed or toned down many of the criticisms made in its first report. In this connection, too, it is important to note that the report of the Subcommittee on Military Public Works of the House Committee on Appropriations, dated Sept. 26, 1952, not only did not condemn the Moroccan program, but actually praised it.

• **No failure**—This is not an article to reopen or review the old arguments, but to set forth the engineering and construction activities as they exist today. It is nevertheless important to establish at the outset that we are not speaking of a job that was a failure or unduly wasteful even in the beginning.

There is little hint of failure in handling as much rock tonnage, doing twice as much excavation and putting down 1½ times as much asphalt paving on the first two airbases as had been scheduled for the five bases originally planned—and doing this in three instead of the initially estimated five months. And there is no great waste of taxpayers' money in an additional expenditure of less than $3 million to replace hastily built substandard pavement in a $400-million program.

To take the most extreme view and relate the repairs only to the $40 million cost of the pavement on the two airbases involved, shows only a 7½% increase in cost to bring up to standard a facility that was ready to serve if the expected war had occurred.

It is also significant that the use of pit-run material cut some $2 million off the original estimate which was drawn up on the basis of crushed rock. If this is considered a saving then, no more than $1-million or 2½% of the $40 million cost is the worst the American taxpayer can complain about—or consider as the necessary extra charge for war risk insurance.

• **Right perspective**—The truth of the whole Moroccan matter is that everyone connected with the job—Air Force, Army Engineers, the architect-engineer firms and the five associated American contractors—pushed with super-human effort to get some runways and aprons in operational conditions quickly.

As would be bound to happen (and will happen again when time is more important than money, completed plans and orderly records) what seemed to be a constructive push by one agency became a destructive pull on another. Resulting impasses had to be removed by quick decisions.

Considering the fact that two sets of facilities were operational within 83 days after the first shovelful of dirt was turned, the decisions were correct. When viewed in the light of peacetime construction operations—as they were viewed after the war crisis failed to develop—some of them were wrong.

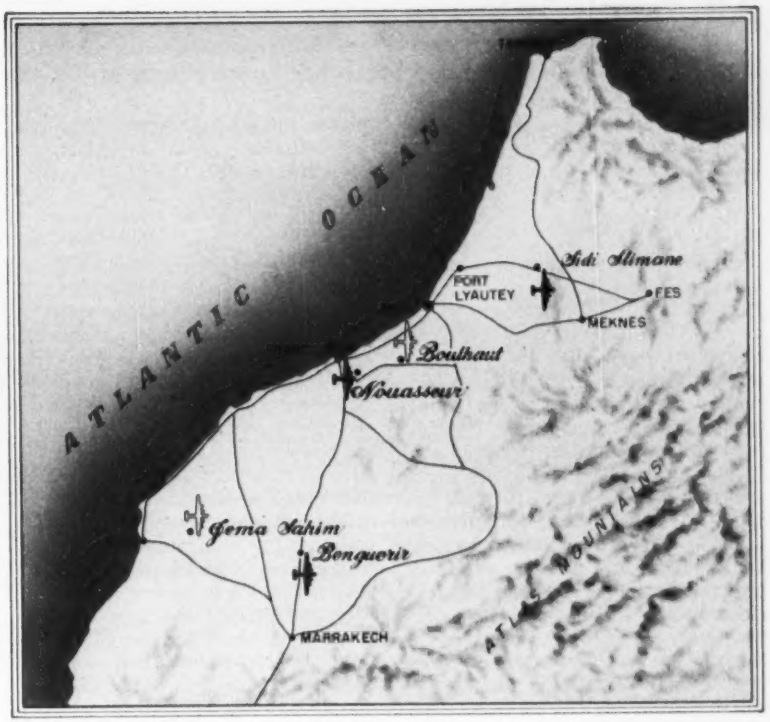
That they ever should have been so

viewed, at least publicly, is open to grave doubt. Every construction job has its starting problems—its period of shakedown when lines of authority are being established, when equipment and materials have not arrived. Efficiency of operation is always less during this period than later.

What it would be if the job were not only located in a foreign country but if all of its troubles and personnel clashes were aired in public, and attempted to be settled or evaluated by public pressure, can well be imagined. What efficiency would be if permission to start construction were postponed beyond expectations, if sites and right-of-way were uncertain, if the size and nature of the job were suddenly changed, if money ran out, can also be pictured.

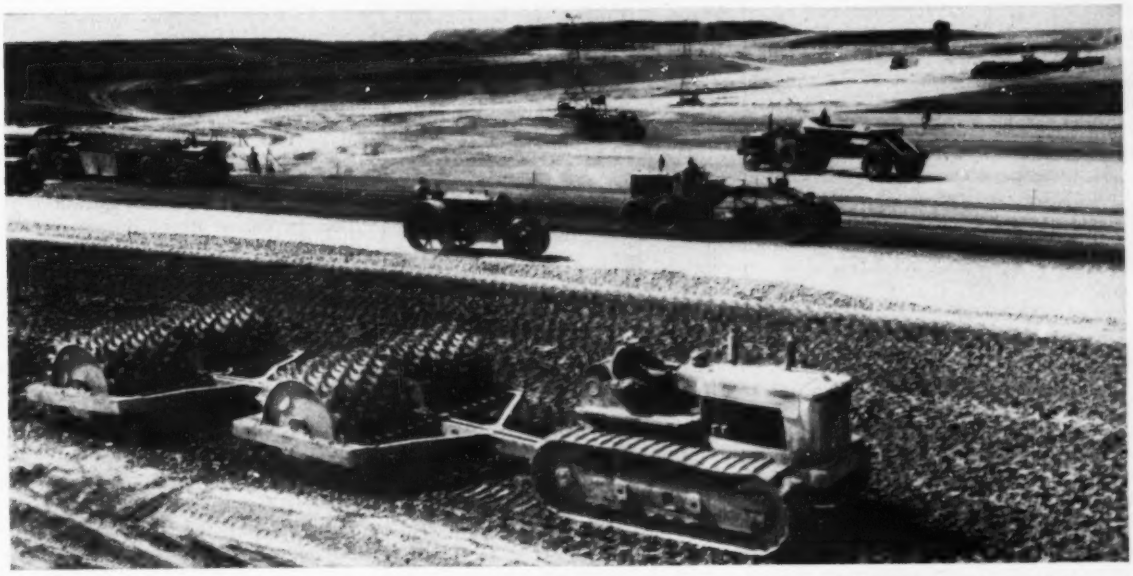
The Moroccan airbase program survived such an experience, and its construction operations are now in orderly swing with good working relationships established among all forces involved. This is the second major miracle of the job, the first being the handling of 5,000,000 cu yd of materials to build the first facilities in less than three months under incredibly bad working conditions and during the starting period of the job.

A third miracle will be the completion of the bases within the original cost estimates—and it has a very good chance of coming off despite the fact that so much personnel and so many record-keeping operations have been added "to protect the American taxpayer" that there is danger of producing more square yards of paper than of pavement. But that is another story—and here we are concerned with the field operations that are fashioning some of our best airbases abroad.



THREE BUILDING AND TWO TO GO represents the airbase situation in Morocco. Those under way (black symbol) are all bomber bases. Of the two to be built (outline symbol) Boulhaut will be for fighter planes, Jema Sahim another bomber base.

• What is involved—The Moroccan airbase program involves four bomber bases (one of which is also the main supply base) and a fighter base. The location of these bases is indicated on the accompanying map, the supply base being at Nouasseur and the fighter base at Boulhaut. Nouasseur and Sidi Slimane are the two bases upon which the early construction operations were concentrated, and upon which work is still progressing. Ben Guerir is actively under construction, with the runway completed. No construction equipment has yet been moved to the Jema



THOROUGH FOUNDATION compaction is a necessity for bituminous pavement. Here, at Nouasseur, are some of the many types of equipment, from sheepsfoot rollers to a water tank truck, used to assure maximum density in the subbase and base courses.

Aftermath in Morocco:

Paving job is enormous but other construction is big too

Sahim or Boulhaut sites, but it is ready to go as soon as the land assembly is completed by the French, which is expected momentarily.

At each base there is a single 200 ft wide runway, a parallel taxiway and operational, maintenance and parking aprons, all connected by cross taxiways. All runways are 11,000 ft long except at Ben Guerir where 14,000 ft is required because of the higher elevation and hotter climate of this site. Except for some concrete pads at refueling points all pavement so far built is of asphaltic, flexible base type.

Because of difficulties in obtaining asphaltic surfaces that will resist the action of jet fuel spillage, consideration is being given to concrete pavement on the two bases not yet started—at least for the aprons and for 1,000 ft at either end of the runways. Depending on relative cost, the entire paving at these bases may be concrete. Since one of these bases is for bombers, it will be designed like the others for 100,000-lb wheel loads. It is contemplated that the fighter base paving at Boulhaut will be designed for 25,000-lb wheel loads.

The facilities planned for each of these bases are similar although there is a greater concentration of buildings at Nouasseur as befits a supply base. Each base has housing, and there will be at least one hangar and the necessary operational buildings, water supply and sewage treatment facilities.

In addition to these facilities, all five bases are connected with fuel pipelines, the entire system being tied to a main supply line from dockside at Casablanca. A total of 365 miles of pipe is involved of which more than two-thirds is laid. Except for about 45 miles of 18-in. pipe, the lines are all of 8-in. diameter.

At the three bases where work is currently under way, construction of all of these facilities, in one stage or another, can be seen. But it is the pavement, and particularly its repair —under way at Sidi Slimane and being planned for Nouasseur—that attracts most attention and deserves initial consideration. Necessary background is a knowledge of the materials and of the type of specifications that control their use.

• **Site conditions and specs.**—Each of the three airbases now under construction in Morocco merits characterization as a "geologic novelty" in the opinion of one of the engineers on the work. Certain it is that each is different in the soils and terrain departments, and all indications are that the other two bases, yet to be started, will be dissimilar enough not to mar this characterization.

Without going into the geology any more deeply than to give a quick understanding of the differences referred to, it should be noted that the pavements at Nouasseur are founded on what is locally called tuf—not volcanic tufa, as some reports have seemed to imply, but a weathered lime deposit somewhat similar to the caliche of our own Southwest. At Sidi Slimane they are founded on blow sand. And at Ben Guerir the pavements are built over solid limestone.

Naturally the geologic effects do not end with the foundations, but extend to the types of materials available for constructing the pavement subbase and base and making the asphaltic concrete. Thus at Nouasseur the quarry yields a very hard quartzite, which is essentially non-plastic under compaction; at Sidi Slimane the only economically available material is a river deposit of gravel, with clay spots that have to be watched and avoided; and at Ben Guerir the quarry is rated as limestone, but is actually extremely variable—ranging from the hard crystalline variety down to what is close to a soft marl.

For all of the bases, the design and construction objectives necessary to comply with the specifications involve compacting the natural subgrade to get as high as CBR (California Bearing Ratio) as possible—on the order of 20; then to secure at least a 35 CBR in the subbase, and finally to achieve a minimum CBR of 80 in the top layer of the base.

At Sidi Slimane and Nouasseur the specifications require a 6-in. subbase, generally put down in one layer and then covered with two 3-in. layers of base course. Material for the subbase is 3½ in. and under in size and for the base layers 1½ in. and under.

At Ben Guerir, where the rock subgrade had to be leveled with a material that could produce a CBR of only about 10, the subbase is thickened to 11 in. (with a 35 CBR minimum required) and then covered with the 6-in. base in two layers. The base here, however, may have material up to a maximum size of 2½ in.

On all of the bases a 4-in. asphaltic concrete pavement was specified—a 2½-in. binder course and a 1½-in. wearing surface.

• **The bad pavement at Sidi Slimane**—Everyone visiting the Moroccan airbase work wants first to see Sidi Slimane where bad pavement is most prevalent and where repair operations are under way. To a large extent morbid, this desire happens also to bring the visitor to the spot where the best picture of all phases of the Moroccan pavement problem can be seen. For not only are the bad results of the early rush program on view, the construction operations on the repaired areas are typical of those being used on all new work on the other bases. And in addition, the testing and tear-up of the poor pavement are uncommon to normal construction experience.

It is important to note at the outset that none of the pavement built at Sidi Slimane was un-usable. Some of it is up to the hightest standards required, large areas are acceptable under the specifications and even the poorest could have been made to do for a number of years. No doubt all of the pavement would have been used had the expected war occurred. But the war didn't occur, and the decision was taken to rebuild the bad areas now instead of repairing them as they might show up under traffic and at a time perhaps when the presence of construction equipment on the field

The Builders of the Moroccan Bases

Army Engineers
- Brig. Gen. Walter K. Wilson, Engineer, Mediterranean Division
- Col. J. P. Campbell, Engineer, East Atlantic District

Atlas Constructors (contractor combination of Morrison-Knudsen Co., Inc.; Bates & Rogers Construction Corp.; Ralph E. Mills Co., Inc.; Blythe Bros. Co.; and Nello L. Teer Co.)
- Lyman D. Wilbur, resident partner
- N. D. Teters, construction manager

Pusom (architect-engineer combination of Porter & Urquhart and Skidmore, Owings & Merrill)
- Jan Porel, general manager
- O. J. Porter, chief of pavement design

Consultants
- Fay, Spofford and Thorndike (for petroleum facilities); Ralph Adams, chief engineer
- Guy B. Panero (for electric power plants)

would be hazardous to planes landing and taking off.

The bad areas at Sidi Slimane can be attributed to three causes in about the following order of importance: clay pockets in the base material, lack of thorough compaction and an initially high watertable. The clay pockets were the result of using pit run material that would have been rejected under less rush conditions. Because of the clay, good compaction was difficult to obtain; and when runway construction outran the drainage ditch excavation that would have lowered the watertable, the clay got wet and was even more difficult to compact.

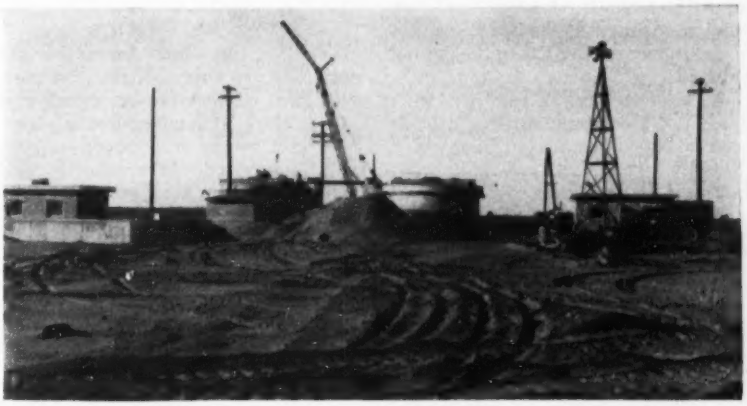
In the repair operations the principal cause of the early difficulties is being avoided by using as base material a good and carefully selected river deposit material, and it is being crushed, screened and placed in accordance with specifications and construction procedures that assure high quality results.

• **How bad pavement is located**—One factor in the unusual nature of the repair operations is that they are scattered in both large and small patches all over the runway and other paved areas. How these bad spots were located is the story of the most severe test to which a runway pavement probably has ever been subjected—and one devised to accelerate defects that would be likely to appear under prolonged heavy plane operation.

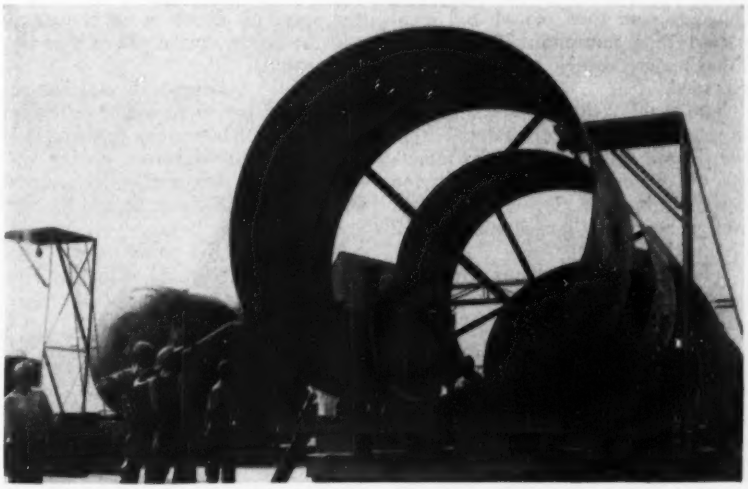
The test involves subjecting the entire area of the pavement to 24 passes of a 200-ton compactor. Considering the spacing of the tires this subjects every square foot of pavement to at least 12 applications of load. Areas that do not exhibit obvious springiness under load or a slow rebound after passage of the load are considered satisfactory. Studies indicate that such a pavement is supported by a base with a CBR of at least 55. Since the base has been down for two years and its water content has reached a natural state of equilibrium, such a CBR value is held to indicate that the pavement is structurally sound.

If, on the other hand, under successive passes of the 200-ton compactor, whose 30x33-in. tires are inflated to 150 psi, permanent, rut-like depressions or heaves occur or map cracking appears, the pavement must be cut out and repaired. Areas in doubt—from the springiness or rebound criterion—are measured by a 3-ft straight edge, and when the deflection from this straight edge is greater than $\frac{3}{8}$ in. the pavement must be cut out if tests indicate plastic movement. Broad depressions of gentle and uninterrupted curvature are not only not suspect but indicate that the rolling has been bene-

FUEL FOR BOMBERS will be brought to all five Moroccan bases by pipeline—365 miles of it from dockside at Casablanca to Nouasseur and then fanning out across country. Construction is an entirely mechanized operation.



SEWAGE TREATMENT at the bases, the first in Morocco, will be carried out in two-story tanks where mechanical clarification and mechanical sludge digestion will take place. The effluent will be chlorinated.



FABRICATION OF FUEL STORAGE TANKS is done at Nouasseur. The 12-ft diam, 56-ft long tanks weighing 29 tons are then trucked to the other bases for burying underground. Here, a longitudinal seam is welded manually while a circumferential joint is readied for the automatic welding machine located farther down the production line.

Aftermath in Morocco:

Major repairs limited to 25% of pavement on one base

ficial in consolidating the subbase and base.

The runway testing showed that about 30% of the 245,000 sq yd had to be repaired. On the remainder of the pavement—apron areas and main taxiway—repair areas total 21%.

• **Repair procedure**—Once an area has been marked for repair, a road grader with scarifier teeth, or sometimes merely a tractor-pulled carrying scraper, is moved in and tears up the asphalt surface. The surface and the old base are then removed either with the carrying scraper unit or with an elevating loader and wagons. The specifications permit leaving in the subbase course if it tests 35CBR or better, but it is frequently more practicable to take out all of the material regardless. Extreme care is required to be exercised not to damage or remove any of the natural subgrade.

It will be recalled that this subgrade is a blow sand. Although it can readily be compacted to a specified 20 CBR, this cannot be done directly, but must be obtained by applying pressure through the first course of subbase. Thus, after the first 6 in. of subbase is placed, one rolling achieves a 20 CBR in the subgrade and a 35 or better in the top of the subbase. With the careful selection of materials now being done for the subbase in the repaired areas—eliminating the fines and clay that caused the initial trouble—CBRs of 50 are not unusual. The rolling of this first course of subbase is done with the 200-ton compactors.

The upper base courses, two of 3-in. thickness, are then placed and compacted to a minimum 80 CBR, although some as high as 100 are being recorded.

The secret of these good results rests in careful selection of material from the deposit of river gravel. By removing all overburden and avoiding too deep digging, all clay is eliminated, and an essentially non-plastic material obtained.

This material is then run through a screening plant, and rocks larger than 3½ in. are removed and crushed to minus 1 in. Finally, to provide the aggregates for the asphaltic concrete surface, all material is further crushed to ¾ in. maximum size. These aggregates (¾ to ⅜ in.) mixed with river sand (⅜ in. minus), and with blow sand to give the necessary fines, are combined with 6.2% asphalt in a standard four bin plant to produce the binder and surface mixtures.

The base of the repaired areas is actually built up to a point where a 1½ to 2-in. binder course of asphaltic concrete will bring the surface flush with the finished surface of the unrepaired areas. Then after all repairs have been made, the entire runway, main taxiway and apron will be paved with a new wearing surface of asphaltic concrete. This will be 2 in. thick on the runway except for 1,000 ft at either end where a 3-in. thickness will be used. The 3-in. thickness also will be applied to the main taxiway and aprons.

The end result will be that the Sidi Slimane asphaltic paving will be either 6 or 7 in. thick as the case may be instead of the original 4 in., except in the repaired areas where it may be as little as 4 in. and never more than 5 in. because of the good new base that supports it.

• **Variations on other runways**—Decision as to whether extensive repair operations will have to be undertaken on one apron at Nouasseur—the other field built in the rush period—is still being postponed. More exactly the testing to determine if bad pavement exists has been postponed until the base material has had every opportunity to dry out.

The reason for this delay is that the few soft spots so far detected are believed to be related to excessive moisture that got in during construction when a relatively large area of completed apron subbase was temporarily left unprotected by an asphalt prime coat in a gambling effort to speed up the work. The gamble was lost when a heavy rain occurred, but the speed-up efforts were continued and the binder course placed over the wet material.

After the maximum dry-out has occurred, this pavement will be subjected to the 200-ton compactor test, and failure areas repaired before placing the surface course pavement which was not constructed initially because of the wet condition of the base.

The rest of the pavement at Nouasseur has been tested with the 200-ton compactor and found to be satisfactory. Both fill material and natural subgrade were of good quality, so that construction operations, even though rushed, produced good results. Thus, although about 18 in. of heavy clay topsoil (like Midwest gumbo) had to be removed along the runway, the tuf subbase that was uncovered could be readily compacted (with special care to moisture) to a 20 CBR with sheepsfoot and 50-and 100-ton rubber-tired rollers. Also rolling could be speedily completed since too much working would pulverize the tuf soil. The only slowing factor was that care had to be exercised by means of special color tests to be sure that the tuf was not mixed with too much clay that had worked its way upward from an underlying layer. Since the line of demarcation between the clay and tuf was very indefinite, a large number of these color tests of the material had to be made. Clean tuf was added where excessive clay showed.

A variation from this procedure was followed in some of the apron areas where poor quality tuf had to be removed to depths as great as 29 in. and replaced with a 13-in. backfill of quarry waste rock that could produce the necessary 20 CBR under compaction.

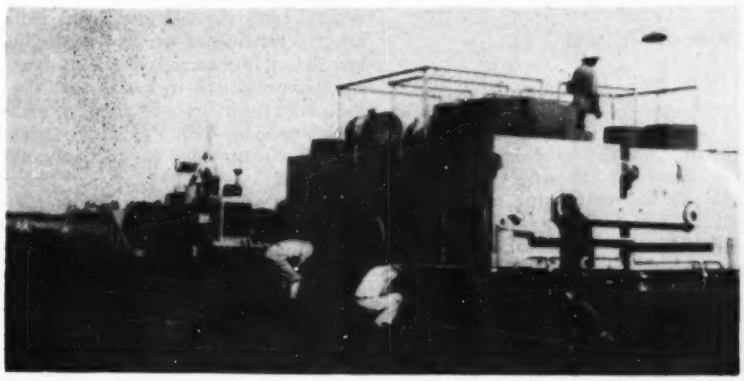
The remainder of the pavement construction operations at Nouasseur were tailored to fit the very hard and practically non-plastic quartzite, which was used for the subbase and base. Difficult to handle through the crushers and requiring heavy compaction, it nevertheless produced a very good foundation. Both sheepsfoot and three-wheeled rollers were used followed by a 50-ton rubber-tired compactor pulled by a crawler tractor to obtain 35 CBR in the subbase. The two top base layers were rolled only with rubber-tired compactors, first with a 100-ton machine and then, as a final operation, with four passes of a 200-ton compactor to give the required minimum of 80 CBR. Usually a considerably higher figure was produced.

Wearing surface mixes and construction were the same as at Sidi Slimane except that a great deal more experimentation was done with percentages of asphalt to get a dense but not too smooth surface. Inasmuch as specified stability of all of these mixes, varying in asphalt content from 4 to 8.3%, was attained, it is believed that all are satisfactory as to strength. Which ones are actually best is then more a matter of what texture of surface the Air Force prefers. Some of the surfaces at Nouasseur showed too much stone and these have been smoothed up by the application of sand, rolled and forced into the asphalt by the traffic on the runways.

Rolling of the asphaltic binder course is done with a three-wheel roller, then a tandem and finally with a wobble-wheel rubber-tired roller. Only the tandems and the wobblies are used on the top course.

Pavement construction at Ben Guerir has no legacy from the rush construction period. Efficient engineering and construction management is, therefore, proceeding in a normal manner to overcome the special terrain and materials problems that have been en-

The detection and treatment of bad pavement at Sidi Slimane



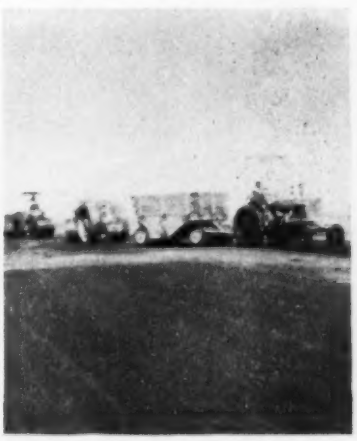
Test: A 200-ton compactor is hauled 24 times over all suspected runway and apron areas, subjecting every square foot to at least 12 load applications.

If ruts and cracks like this appear, the base has failed and must be replaced.

Tear-up: Bad pavement areas are dug up with carrying scrapers, sometimes after scarifying.

Old base material is removed by elevating loaders, to make way for a new compacted fill.

Repave: New asphalt surfaces are placed over the thoroughly compacted base courses making the repaired areas among the best in the program.



Final operation is surface compaction with tandem, wobbly and three-wheel rollers.

Aftermath in Morocco:

Non-rush base shows construction at its best

countered—and to produce a pavement that is up to top stateside standards in every way.

Since the airbase site is in desert country subject to wind erosion—which is the more serious because of sheep grazing—the underlying rock is very near the surface. What cover there is, is a clay that fills pockets in the undulating surface of the rock foundation. These clay pockets could be made to produce no more than a 3 or 4 CBR, so the procedure adopted is to remove them and refill with quarry material. This dental work of removing the clay pockets, some as much as 2½ ft deep, is tedious and expensive, as is the placing of a 27-in. leveling course of 5½-in. max. size rock.

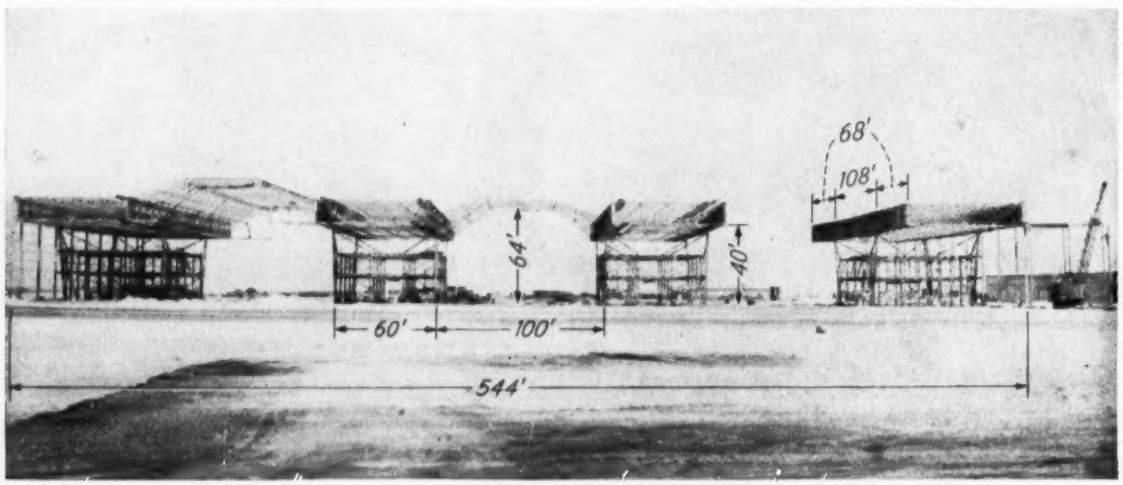
Pavement construction at Ben Guerir follows the procedures used at the other sites except that the subbase is 11 instead of 6 in. thick. In addition, however, the work must cope with the variable quality of the lime rock available. This requires selective quarrying and then carefully controlled crushing operations.

In the crushing plant—of 6,000 cu yd, daily capacity and planned to handle a 2,000,000-yd total during the life of the job—there are four crusher lines, each starting with a 36x42-in. jaw, but containing different combinations of sizes in the other two crushers in each line. Each grade of quarry rock thus can be directed to the crusher line best suited to it. In addition, stockpiling of the crushed product is done in thin horizontal layers so that the loading shovel, by taking vertical bites through the layers, will effect a mixture of the best with the less desirable material. By thus averaging low-plasticity rock with that having plasticity indexes of as much as 8 or 9, a product with a plasticity index of 2 to 3 is provided for subbase construction.

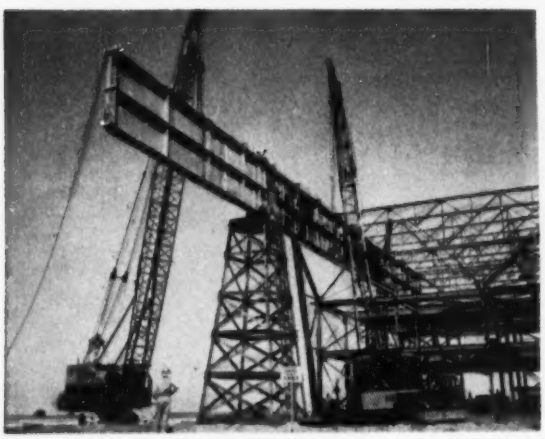
Rolling at Ben Guerir is done as much as possible with rubber-tired tractor power since crawlers have a tendency to break up the relatively soft rock. Sheepsfoot rollers are also kept off the subbase for the same reason.

The Ben Guerir paving work is a fine construction job in every respect. Basically more difficult and involving more yardage than either Nouasseur or Sidi Slimane, it shows what the engineers and contractors can do when normal rather than emergency time schedules and conditions prevail. At

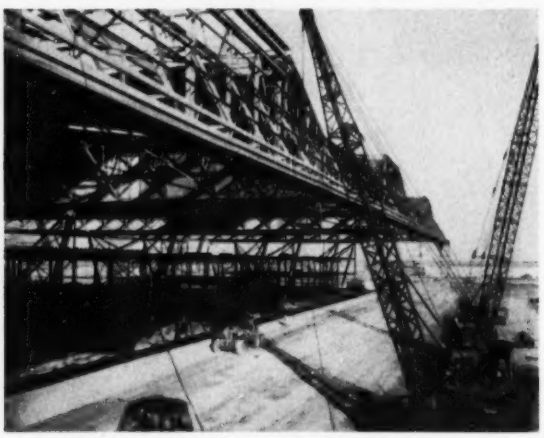
Huge cantilever hangar for six bombers



Pairs of girders over the service area framing furnish supports for the cantilver roof trusses that span the bomber bays.



Erecting 68-ft cantilever of one of the 12-ft deep girders. The weight is 34 tons. The splice is bolted.



Door guides and end wall steel are hung from ends of girder cantilevers. Note the inclined columns that support the girders.

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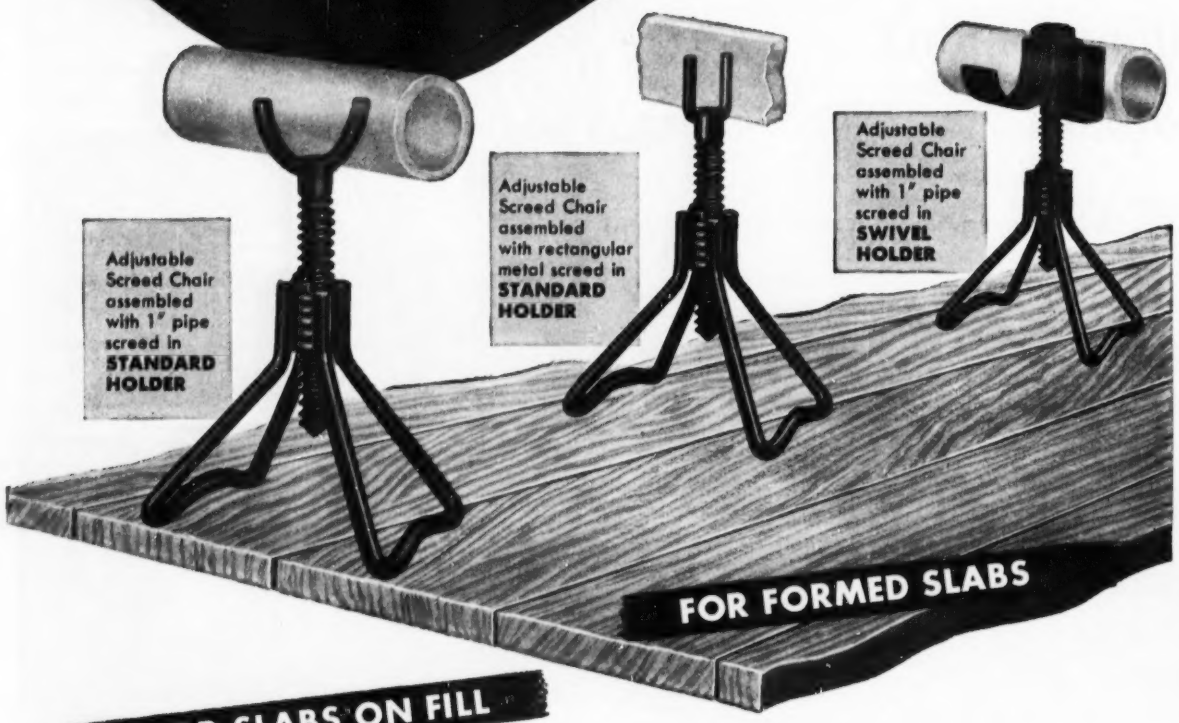
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Adjustable Screed Chair assembled with rectangular metal screed in STANDARD HOLDER
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Aftermath in Morocco:

Unusual buildings add to job's eminence

the same time the pavement produced will not be measurably better than that which will finally emerge at the other two sites after the repair operations are finished. All three of the present Moroccan bases, it is confidently being predicted, will fully meet the needs of our aircraft and the desires of the Air Force.

But pavement, although important and perhaps the largest single item in the program, represents only about one-quarter of the total $400 million required for the airbases. The building requirements are nearly as large, and they have produced some interesting structures.

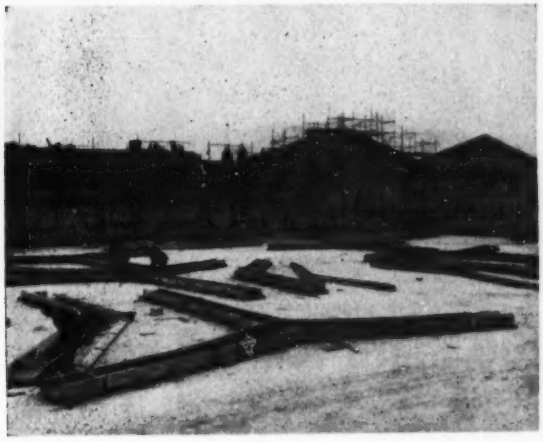
• **Steel cantilever hangar**—Big bombers can be repaired and serviced only in big hangars, and several of these have been planned. The one so far completed is located at Nouasseur and duplicates a new and unusual steel design that the Air Force had tried at its Albuquerque, N. M., base just before the Moroccan project was started.

Developed by the Pacific Iron & Steel Co., the hangar accommodates two big bombers (end-to-end) in each of three 100-ft wide bays. Between these bays and at the sides of the hangar are 60-ft wide service bays in which the steelwork that supports the roof and the door assemblies at either end is concentrated.

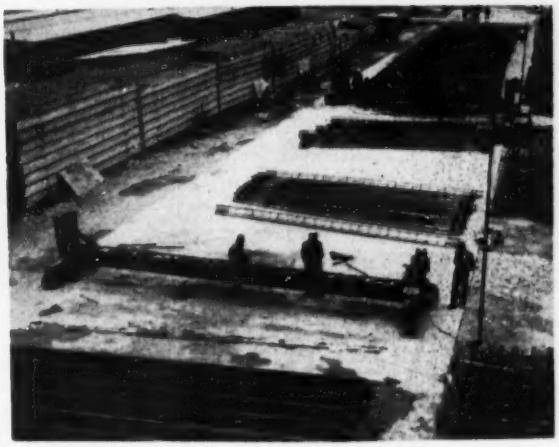
The feature of the steelwork in each of these bays is a pair of plate girders, 12 ft deep and 244 ft long, extending 68 ft at either end from supports in the form of columns that are inclined 14 ft from the vertical in order to reduce the length of the cantilever. The tops of these columns are tied back to vertical columns that also comprise the corners of a two-story tier framework, 60x80 ft in plan. It is within this framework that the service facilities are concentrated—shops on the ground floor, offices on the second and parts storage on the third.

From the sides of the plate girders, as shown in the accompanying illustration, light steel roof trusses, made up of 30 ft cantilever arms and a 40 ft suspended section, extend across the plane bays. And at the ends of the girders is carried the framework for the 40 ft high doors which, when rolled back into recesses at the sides, completely open the ends of the hangar to the aprons. Another feature is

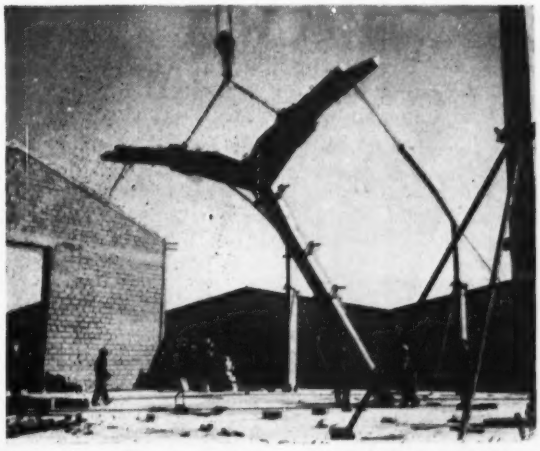
Prefab concrete rigid frames for warehouses and shops



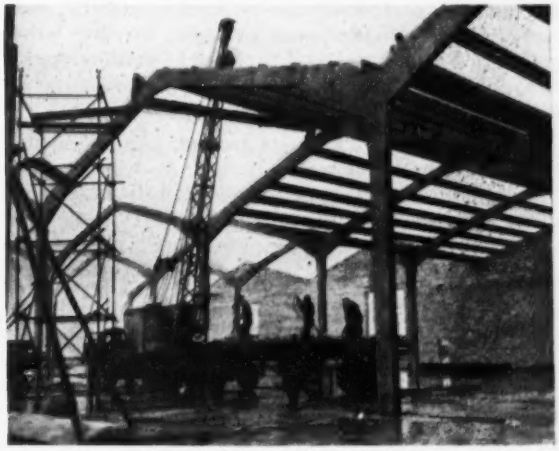
Manufacture: Forms for L, V and Y-shaped units that make up the frames are readied for concreting on the building floor.



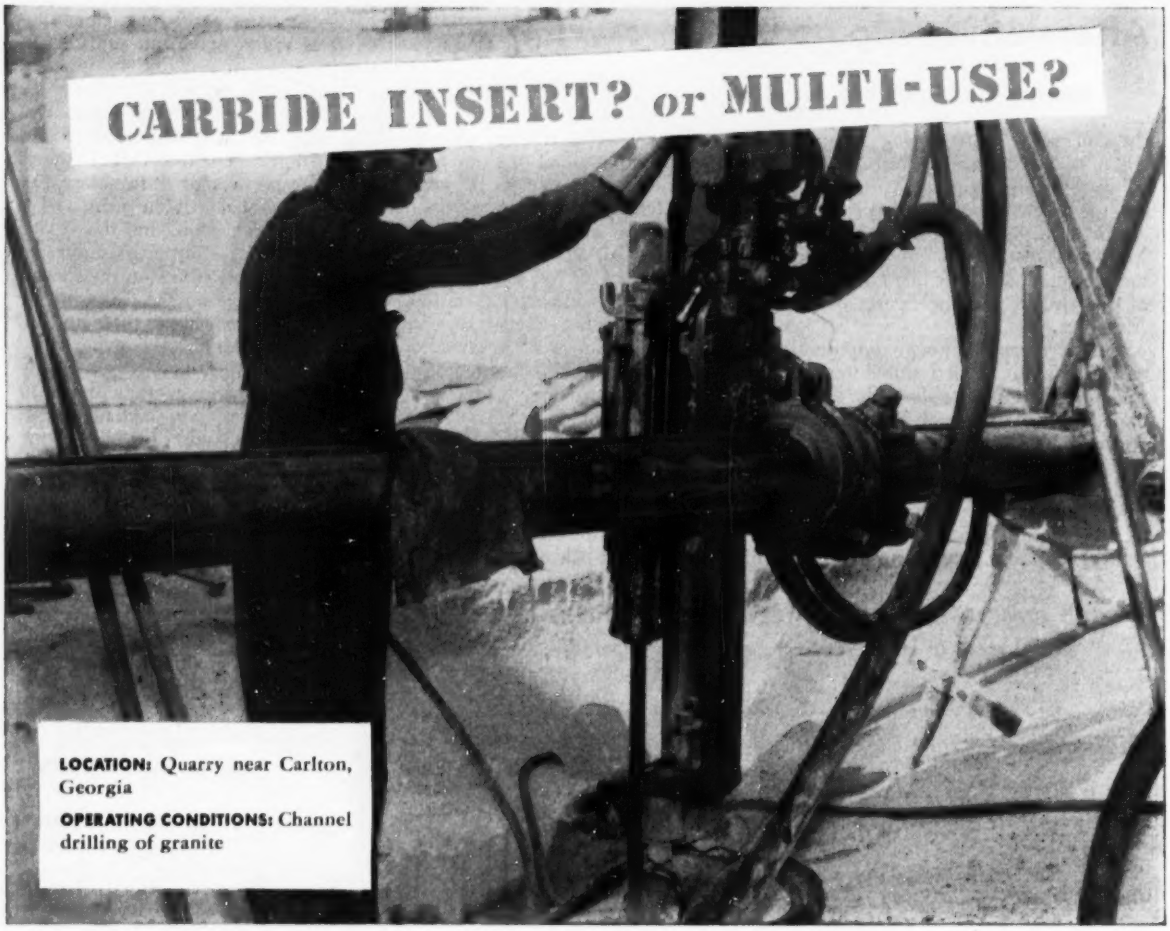
A vibrating form of shaking-table type on wheels turns out prefabricated reinforced concrete roof purlins at a rapid rate in a manufacturing yard set up for the purpose.



Erection: Frame members are lifted and set in holes in the floor slab which are backfilled with concrete.



Roof purlins are erected by truck crane. In Morocco stone walls are built as cheaply as those of concrete blocks.



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Aftermath in Morocco:

Each base is a fair-sized fully equipped city

provision to remove a section of the end framing over the center of each plane bay (by rolling it on a circular track), to provide an opening that will admit the tall tails of the big bombers.

All of the steel was fabricated in the U. S., each of the girders being shop-welded in five 34-ton sections for shipment. Assembly in the field was by bolting, and erection was done with crawler cranes.

When completed, with walls, doors and lean-to buildings at either side installed, the hangar will have plan dimensions of 625x259 ft. The apron paving, a 16-in. concrete slab, extends through each of the plane bays, while an 8-in. slab is installed in the service bays. Concrete block encloses the ground and second floors of the service bays, but only a barrier of wire mesh is used around the third-floor parts storage. This third floor is also open at the top so that a monorail hoist system that is hung from the girders can be used to move parts from storage to other parts of the hangar. All of the exterior enclosure of the hangar is galvanized iron sheeting.

In addition to these large hangars, numerous other types of buildings are planned and under construction. These include some special smaller nose-type hangars still under study and development for Sidi Slimane, conventional concrete frame and concrete wall buildings for barracks, mess halls, and the like, and four types of warehouses and shops: an all-steel (frame and walls) structure of U. S. manufacture with 40x60 ft bays, two German designs with steel frame and cement-asbestos enclosure, and a prefabricated concrete rigid frame with masonry walls supplied by a French firm, but following a patented British design. Only the latter is of any particular technical significance.

• Prefab concrete rigid frame—Known as T.P.S. (from the name of the French firm, Travaux Precedes Speciaux), the prefabricated concrete frame buildings are being manufactured and erected by a Casablanca builder under a subcontract. Two sizes are being built, one with 53-ft, the other with 122-ft span bays. Lengthwise of the buildings, the frames are spaced on about 24 ft centers.

For precasting purposes and to provide reasonable-weight members for erection, the frames are spliced in the roof rafters. Thus, one precast unit, consisting of the rafter either side of the roof peak, is V-shaped, while the column unit, which incorporates the remainder of the roof rafter, is either L- or Y-shaped depending on whether it is for an outside or interior line of columns. A 13.5 ft length of rafter is cast with the columns for the 53-ft span bays, and a 17-ft length for the 122-ft span bays. Column sections for the two spans are respectively 20x8 in. and 24x8 in. The rafter splice is a stepped joint, bolted and then filled with mortar.

The construction plan for these buildings is to pour the concrete floor first, thus providing a casting platform for the frames. Wooden forms—plywood on the bottom, 2x8-in. timbers on the sides and open on the top—are laid out, the reinforcing installed, and truck-mixed concrete placed by buggies. Internal vibrators are used, and the top surfaces are screeded.

In addition to the frames, the roof purlins for these buildings are precast and, for this mass production operation of angle-shaped members of a single standard size, the contractor established a central casting plant. The feature of this operation is a special mobile steel form mounted on an electrically-actuated eccentric to impart a shaking-table type of vibration to the concrete. Reinforcing cages are set in this form, concrete shoveled in, the form vibrated, and then pivoted and lowered to discharge the purlin onto the casting floor where it remains for the curing period. The form is rolled back a few feet, another purlin cast, and the operation repeated.

Arab labor is used exclusively on all of this casting work, as well as for erection of the units which is done with a truck crane. The columns are set in recesses in the floor which are then filled with concrete to assure the fixed-end condition for which the frames are designed.

Arab labor is also responsible for the unusual walls that enclose the ends of these buildings. These are of cut stone fashioned right on the job from pieces of blasted quarry rock and laid up with struck mortar joints to provide an imposing 20-in. thick wall. Only an 8-in. concrete block wall was planned for these buildings (at an estimated cost of 18c per block in place), but the local contractor preferred to use the stonework, and guaranteed to beat the estimated concrete block price.

Despite this interesting use of stone, however, concrete block is a major building material on the Moroccan bases, being used for all barracks, mess halls, recreation buildings and some of the warehouses and shops. Before the job is finished it is estimated that about 7 million blocks will be used. It was thought at one time that as many as 20 million might be required, but changes in the types of buildings cut the estimated quantity. As a matter of fact, the blocks are turned out so fast by each of the U. S. machines (5,000 per 8 hr shift) that two of the five machines originally on hand were shipped to other Mediterranean bases.

• Other facilities—Besides buildings, the Moroccan bases require many other facilities among which water supply and sewage treatment are worthy of brief note.

Except for septic tanks, sewage treatment is an unpracticed art in Morocco. Each of our airbases will thus constitute a pioneer installation, with its 30 ft diameter two-story clarifier and digester tanks providing a clear effluent that will be chlorinated before it is turned into the water courses. The terrain is such at Nouasseur that fourteen pump stations are being installed, with lifts up to 16 ft. A fewer number will be required at Sidi Slimane, and none at all at Ben Guerir where all areas can reach the plant with gravity flow.

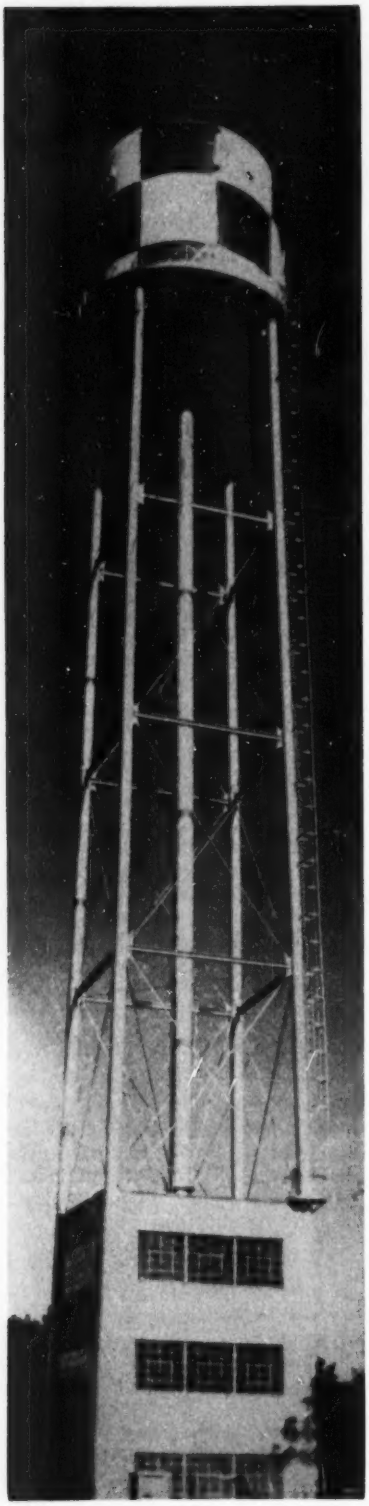
Water supply for these bases constitutes another important problem and generates a considerable construction task of pipeline laying and well digging. Nousseur's requirements will exceed 1 mgd, which will be obtained from Casablanca's new storage reservoir on the Rbia River. At the other two bases supplies up to 0.6 mgd are being developed from wells. All water will be chlorinated.

For distributing this water and for disposing of the sewage, the piping requirements for the five-base program are enormous. Just to take one base, Nouasseur, piping for sewer lines totals 93,000 ft and for water distribution 100,000 ft. In addition there are 40,000 ft of water supply lines, bringing the pipe requirements for this one base to over 40 miles.

Another big facility operation is the establishment of fuel distribution and storage systems on the bases. Beyond the ditching and plumbing, this also involves a considerable amount of steel plate fabrication to provide the necessary number of 55,000-gal tanks to be buried in the ground at the plane fueling points.

And finally there are roads, railroads, power plants and all of the electrical facilities, which makes each Moroccan airbase a fair-sized and fully equipped city in itself. The work other than pavement in Morocco is a huge construction job in its own right. And it, too, is being carried out in a way that will produce the good airbases that are the objective of all concerned.

Rust in water system checked by deaeration



DEAERATION PLANT was built within legs of elevated tank at St. Albans Naval Hospital on Long Island, N. Y.

J. L. Staunton
Seelye, Stevenson, Value & Knecht
New York, N. Y.

Corrosion of water systems is a function of the dissolved oxygen in the water. If this dissolved oxygen were completely removed, there would be no corrosion at all. Oxygen and other dissolved gases can be removed from water by heating (hot water deaeration) or by lowering pressure over the water surface (cold water, or vacuum deaeration). The former method is common in boiler feed water treatment, where heat is generally available. This latter method, too, has a good future in the water treatment field, as demonstrated by a recent installation in a large Naval hospital in New York.

First known large-scale use of vacuum deaeration in this country was at Fort Sulphur, La., in 1935. This plant was designed by Sheppard T. Powell, Baltimore consulting engineer, and deaerated some 3.8 mgd of Mississippi River water before pumping it to a sulphur mine 10 miles away. This installation was in for 8 years without any appreciable loss of delivery. Corrosion prior to the installation of the deaeration system had decreased the delivery from 4.0 to 3.2 mgd in 129 days.

• **Recent application**—The U. S. Naval Hospital at St. Albans, Long Island, N. Y., was constructed during World War II. Due to the need of conserving certain materials at that time, steel pipe was used on all the cold water, hot water, steam and condensate return piping. Water supply for this hospital comes from a deep well system supplied by a private utility. This water is not normally considered to be corrosive to the usual cast iron, copper, and red brass piping commonly installed. But it is very corrosive to steel.

By 1948 the maintenance of the piping systems became a major problem. The Third Naval District employed Sheppard T. Powell to study the situation. His recommendations were that the piping system should be cleaned and that vacuum deaeration should be used to prevent further corrosion of the piping systems. Seelye, Stevenson, Value & Knecht was retained to design a deaeration system and to prepare plans and specifications for rehabilitation of the piping.

The vacuum deaeration system was constructed by Bonwit Construction Company in 1951. Construction was supervised by Capt. M. Y. Neely and Lt. Ralph Brescia, resident officers in charge of construction. This plant has been in satisfactory operation continuously since that time.

• **How it works**—General features consist essentially of incoming piping including booster pumps, a rate of flow controller, a vacuum deaeration tank, a steam ejector, service pumps, and an elevated storage tank.

The deaeration tank itself is a steel vessel 7 ft in diameter and 20 ft high. At and near the top of this tank are the connections for the incoming untreated water and the steam ejector suction. Water discharges down through a set of spray nozzles onto multiple layers of wood slats which take up the greater portion of the tank. Purpose of these wood-slat bundles is to give the water as much surface as possible to facilitate removal of the dissolved gases by the steam ejector. Below the wood-slat bundles is a storage compartment having about one minute's retention.

The inside of the tank has a protective coating to inhibit corrosion. The tank has two access manholes for inspection and repair of its interior. A thermometer and pressure recording gage are attached near the top, while sight glasses, a thermometer, a high and low level alarm, two manometer connections, and a liquid level controller are attached to the tank in the storage zone. The liquid level controller operates a flow-rate controller through a compressed air system.

At the bottom of this deaeration tank is an outlet pipe that drops to a manifold connected to the suction of the service pumps. These pumps force the water into the system and into the elevated tank which is floating on the system.

The U. S. Naval Hospital originally had five points of entry to its looped water distribution system. Construction of the deaerator required shutting off all but two of these points of entry. One remaining point is adjacent to the deaerator, which in turn is near a 600,000-gal. storage tank and fire pumping station. Water from the other point of entry is now piped directly to the deaeration plant. With these two independent sources of supply, the storage tank, and the booster pumps, a continuous supply of water is on hand at all times.

• **Controls**—The service pumps are set to operate at different pressures. Thus, as the water level in the elevated tank drops the different pumps start to operate. As these pumps start they cause

the water to drop in the deaerator. This in turn causes the liquid level controller to operate the rate of flow controller, thus allowing more water to flow into the deaeration tank is always the same as the pumping rate of the service pumps. Estimated peak future pumping rate of the three service pumps in 1,400 gpm.

The elevated tank is designed to hold 50,000 gal as fire storage and 50,000 gallons as operating storage. Height of the tank was determined by the pressures required in the hospital system during peak domestic use. A floating cover of the open pan type has been installed inside this elevated tank to keep water in the tank from coming in contact with the atmosphere and reabsorbing gases which were removed. To keep this cover operable in winter, it was decided to heat the water in the elevated tank in the same manner elevated fire storage tanks are heated.

•Results and costs—Cost of the entire deaerator system including elevated tank, deaeration system, enclosure, drainage and all utilities was $200,000. To save space and cost of the construction, the deaeration tank and pumps were placed under the elevated tank; this space was enclosed.

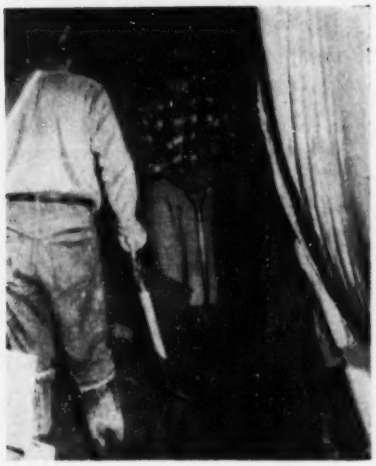
Operating cost figures are not available, however, this cost can be figured for any job. It would consist of two parts. The first would be the cost of providing the desired vacuum either by steam or vacuum pumps. The other would be the cost of establishing or reestablishing the head required for the system. This would be variable depending upon the job and the location chosen for the deareation system.

The incoming water supply can be expected to be saturated with air and also contained 15 ppm of carbon dioxide. It comes into the station at temperatures as low as 50 deg. F. Since the desired dissolved gas content to prevent corrosion is 0.2cc per liter (about 0.3 ppm) of dissolved oxygen and 5 ppm of free carbon dioxide it was specified that the vacuum obtained in the deaerator should be at least 29.1 in. of mercury.

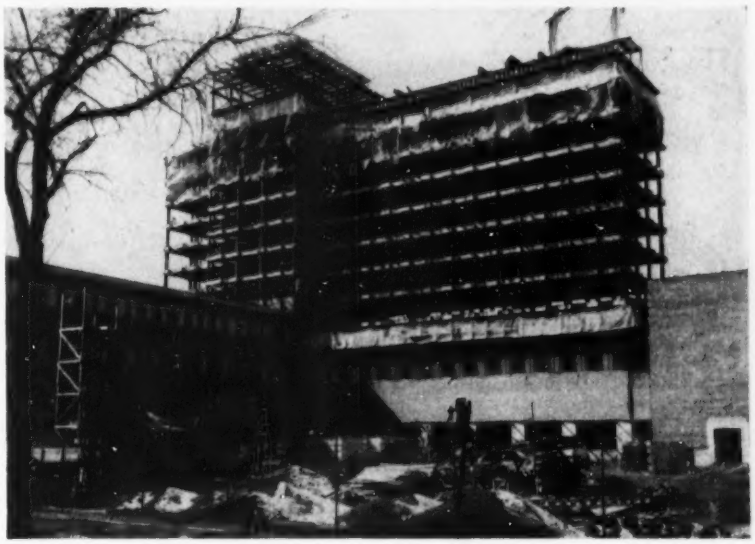
Although it has been claimed that water without dissolved oxygen would become anaerobic with resultant bad tastes and odors, this has not been the case at St. Albans.

Currently, the Bureau of Yards and Docks, Department of the Navy, is devising a system of checks which will be used to maintain a record of the effectiveness of the installation. These records will then be used by the Navy to evaluate the feasibility of installing this type unit at other naval activities.

The deaeration tank and steam ejector were manufactured by the Worthington Pump Company.



Concrete pumped 17 stories



in bolted steel hospital

Pumped concrete and high tensile strength bolts hastened erection of the $11.5-million steel-frame Mayo Memorial Medical Center, on the campus of the University of Minnesota in Minneapolis. The 17-story main building and four 6-story wings will be completed next spring.

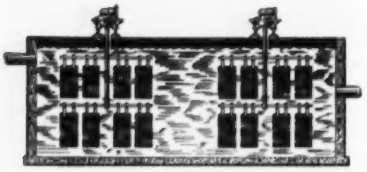
Originally, the main building was to be 22 stories high, but rising construction costs and lack of sufficient funds forced alteration of plans to the pres-

Contract Bids

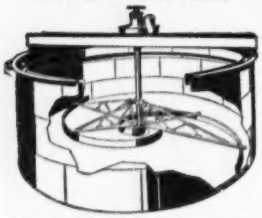
Contract	Contractor	Price
Excavating	C. F. Haglin & Sons	$ 266,400
Structural Steel	American Bridge Co.	650,000
Plumbing	Harris Bros. Plumbing Co.	2,140,181
Electrical	Batzli Electric Co.	757,657
Refrigeration	King-Fruen Co.	32,857
	Westerlin & Campbell	161,890
Elevator	Otis Elevator Co.	288,375
Conveyor	Standard Conveyor Co.	12,634
General Contract	Steenberg-Madsen	5,630,632

HARDINGE

Equipment For Water, Sewage and Trade Wastes

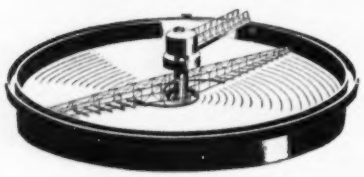


FLOCCULATING UNITS

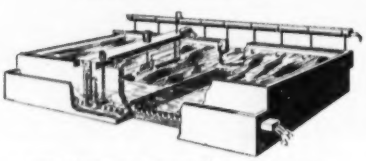


"AUTO-RAISE" THICKENERS

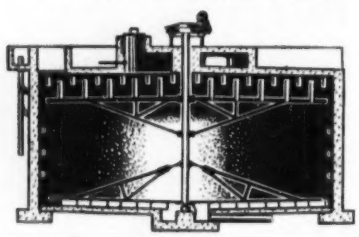
RECTANGULAR CLARIFIERS



CIRCULAR CLARIFIERS



AUTOMATIC BACKWASH FILTERS



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ent design. It will provide six stories for hospital facilities, research laboratories and offices; eight stories for medical-school classrooms and laboratories; and a three-story penthouse for mechanical equipment.

The six connecting wings will furnish hospital facilities, storage, maintenance, and a central sterile supply room. A wing containing a 264-car garage also will include an auditorium with seats for 600 persons.

Floor area totals 529,600 sq. ft. Of this, 330,400 will be for hospital facilities and laboratories, 93,500 for the garage, 22,800 for the auditorium, 36,700 for storage, and 26,200 for pipe space and mechanical equipment.

• **Quiet, please!**—Among the builders' problems was the elimination of construction noises because of proximity to other hospital buildings. This requirement precluded use of riveted connections, leaving the alternatives of field welding or bolting. However, no welding bids were received, probably because of a limited supply of qualified welders.

Bolted connections are of two types. Ordinary bolts are used in the wings and high tensile strength bolts for all beam-to-column connections in the main building.

High-strength bolts had been used very effectively under similar conditions for the Mayo Clinic Diagnostic Building at Rochester, Minn. (ENR Sept 6, 1951, p. 34).

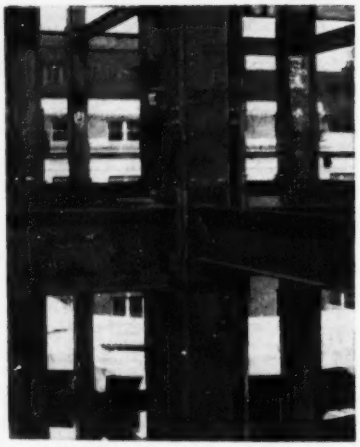
"An advantage over riveted construction," says C. W. Durr of C. H. Johnston, architects-engineers for the new medical center, "is that where high-tensile bolts are used there is no need for temporary erection bolts."

A total of 26,642 high tensile strength bolts were used in the main building under the AISC specification, "Assembly of Structural Joints Using High-Tensile Steel Bolts."

• **Concrete pumped**—A major obstacle to quick erection appeared when a steel strike forced suspension of fabrication and erection operations by the American Bridge Co., with only a portion of the 2,241 tons of structural steel in place. Faced with a halt in steel supply, the contractor, to speed up operations, decided to pump the concrete floors into place from a mixing plant at ground level, despite the 17-story height of the building.

Two machines pumped the concrete through 6-in. lines. The pipes were supported every 20 ft on A-frames tied to the building.

For the lower floors, the machines supplied up to 34 cu yd of concrete per hour; but for the upper floors, the machines averaged only 15 cu yd of concrete per hour. Nevertheless an



CONNECTION of beams to columns was made with high tensile strength bolts.

eight-man crew was able to pour one floor (350 cu yd) every week from the 7th to the 17th floor.

At fifth-floor level, a problem arose, with the development of a lateral thrust on an elbow fitting where the pipe entered the building. To eliminate it, fittings allowing a more gradual change in direction were inserted, reducing friction losses. After that, the steel frame no longer was jarred by each surge of the concrete through the line.

• **Record claimed**—A record height of 176 ft 4 in. for pumping concrete was established while pouring the roof of the three-story penthouse above the main building, the contractor claims. The previous record, he says, was 110 ft.

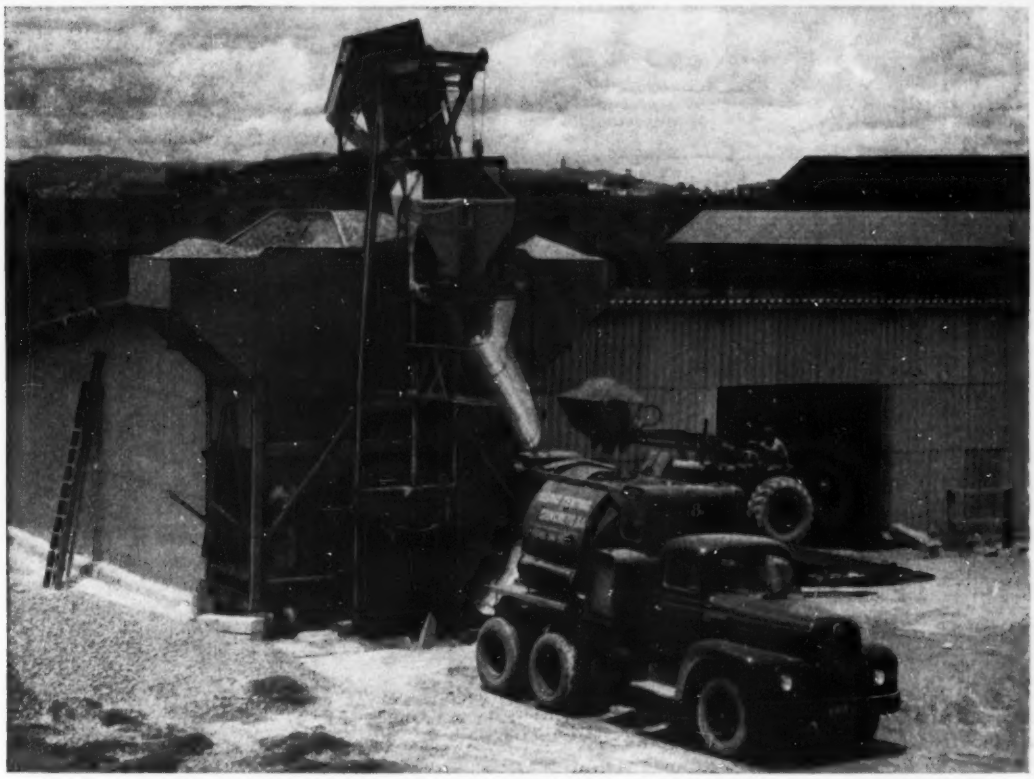
The maximum length of pipe from the pumps to the point of pouring was 550 ft. To deliver material at the end of the line after starting the machines took 15 min.

Savings over placement from buggies is estimated at about 30 cents per cu yd for the 12,000 cu yd poured in the main building and wings above ground level. In all, 23,000 cu yd were used for the entire job, which included a two-story garage constructed below grade.

• **Speedy bricklaying**—Suspended scaffolding, continuous around the building, enabled masons to lay 995,000 face brick in three weeks. The scaffold was canvas-enclosed to permit work in all weather.

The medical center was designed by C. H. Johnston Architects-Engineers, St. Paul, Minn. Steenberg-Madsen Construction Co., also of St. Paul, is the general contractor. Carl Rasmussen is construction superintendent. Roy Lund is supervising engineer for the University of Minnesota physical plant department.

ERIE PORTABLE TRUCK MIXER PLANT BIG SUCCESS DOWN IN SAO PAULO, BOOMING CITY OF BRAZIL!



One man operates this Erie-Strayer Portable Concrete Mixing Plant. Set-up includes: 40 cu. yd. materials bin; 70-ton per hour bucket elevator for loading bin; 1-cu. yd. mixer and 1-cu. yd. bucket hoist for loading truck mixers with pre-mixed concrete. Sold by: Vias E. Viaturis, Sao Paulo, Brazil.

ANTONIO MARQUES SOARES OF USINA CENTRAL De CONCRETO, S/A, SAO PAULO, SAYS: "THE ERIE-STRAYER PORTABLE IS EXTREMELY USEFUL AND VERY MUCH RECOMMENDED . . . PLAINLY SATISFIED"

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"It is very much recommended for the supply of concrete destined to huge operations which call for various types of rationally mixed concrete, and for consumption of a minimum of 100 cu. yd. per day.

"We are plainly satisfied with the performance of this fine machine."

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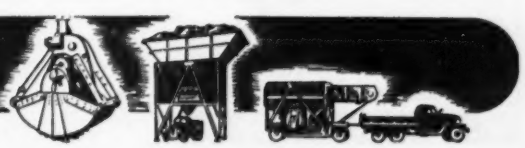

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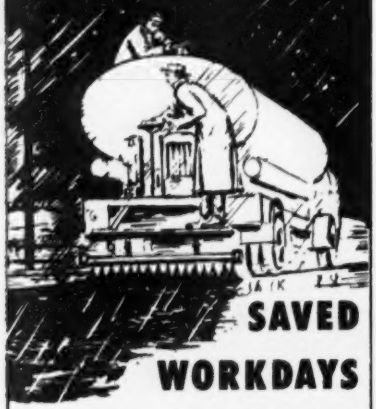

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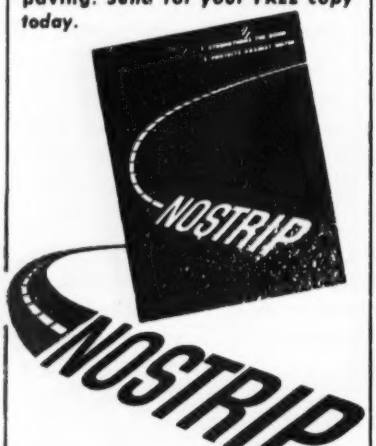

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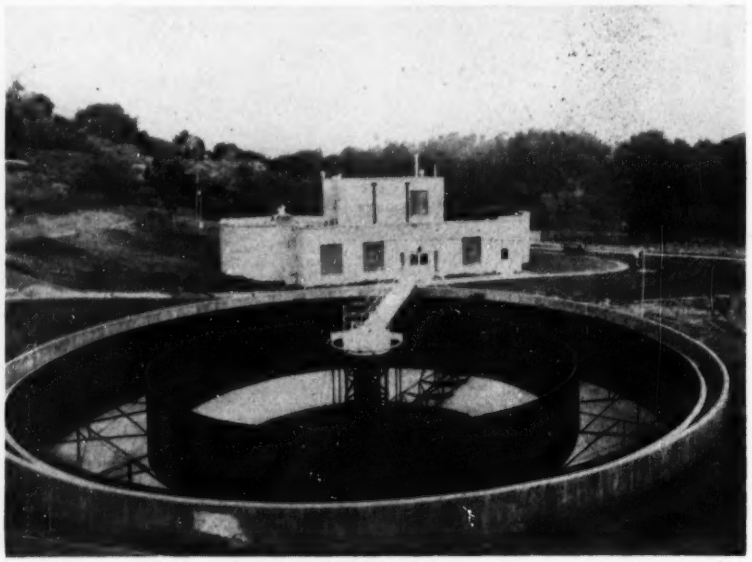

COMBINED WASTE disposal plant, Golden, Colo., features a new oxidator-clarifier design and flotation before primary digestion.

Brewery and city wastes combined in unusual disposal plant near Denver

Innovations in construction design and treatment procedures have been developed in a sewage disposal plant built by the Adolph Coors Co., to handle wastes from its huge brewery and the city of Golden Colo.

• **Spectators welcome**—Coors officials hope their model plant will point the way to cheaper sewage disposal methods for many small communities. The plant is available to Colorado colleges as a laboratory for experiments in sewage disposal and also for teaching sanitary engineers. Municipal authorities are invited to study the plant's operation.

The brewery, largest in the Mountain West, is on the eastern outskirts of Golden, a city of 6,500 about 12 mi west of Denver in the Rocky Mountain foothills. Wastes from the brewery and the municipality formerly were discharged untreated into Clear Creek.

Mayor Everett L. Barnhardt of Golden said the city would share in the cost of operating and maintaining the disposal plant. He said the charge to the city probably would not be determined for several months.

• **50-50 operation**—Barnhardt said it appeared that the city would bear about one-half of the cost of operations. Initial reports showed the city sewage to represent about half of the waste treated at the plant.

"The city of Golden considers this a good bargain," the mayor said. The city's share of the operating cost will be paid out of the general fund.

Experiments with a pilot plant for more than a year led to incorporating the innovations in the new plant. They were developed by E. O. Edlund, head of the Coors engineering department; Howard Lewis, who formerly operated a municipal disposal plant at Colton, Calif.; Bryant Holland, head of the Coors laboratories, and other company experts.

• **Unusual features**—The most notable departures from conventional methods, Coors officials said are:

• The use of thermophylic bacterial digestion at a temperature of 130 F in the primary digester as contrasted with a range of 80 to 98 F in the conventional use of mesophilic bacterial digestion.

• Installation of the first pressure flotation unit in the country for the concentration of sludge.

L. S. Farrell, manager, flotation division, Process Engineers, Inc., of Los Angeles, supervised installation of the

flotator. He said it was the first time this type of unit had been used in a municipal sewage plant.

• **Reduced size**—Use of the high temperature digestion method and the flotator permits construction of a primary digester tank only one-third as large as in a conventional plant, Edlund said. This is accomplished in two ways. By using the flotator, the sludge is concentrated up to 12% solids, as compared with 1.5 to 3% solids in the customary aeration of raw sewage before it goes directly to the primary digester. The smaller volume of water going into the digester, thereby reduces the size requirements of the tank.

• **With greater efficiency**—The thermophylic bacteria digesting method, Lewis said, causes a 75% reduction of volatile solids in 17 to 20 days in the primary digester. The ordinary sewage disposal plant, he said, obtains about 55% reduction in volatile solids in 30 to 60 days, and because of the speedier digestion, a smaller tank can be utilized in the high temperature method.

Lewis reports other major benefits. Bacteria of the mesophilic range, which are cultivated in the usual digester at a lower temperature, can not break up oils and fats. These oils coat organic matter which rises to form a sludge blanket at the surface.

He reported that the thermophylic bugs, cultivated at 130 degrees, penetrate the oils and attack the organic matter to prevent formation of the sludge mat.

• **Bugs—the tough task**—Experiments by Dr. Holland led to the isolation of two types of thermophylic bacteria that convert the volatile solid into methane gas a primary objective in the digestive process. Discovery of suitable bacteria was one of the most difficult parts of the new project, Lewis said. Many of the bacteria originally found by Holland in his studies survived the high temperature but failed to produce methane. The bacteria are two kinds of germ-negative rod-types that multiply every 20 minutes. They include both the aerobic and the anaerobic types of organisms.

According to Lewis the volume of methane gas produced by the thermophylic bacteria is no greater than that produced by the mesophylic variety at the lower temperature. However,

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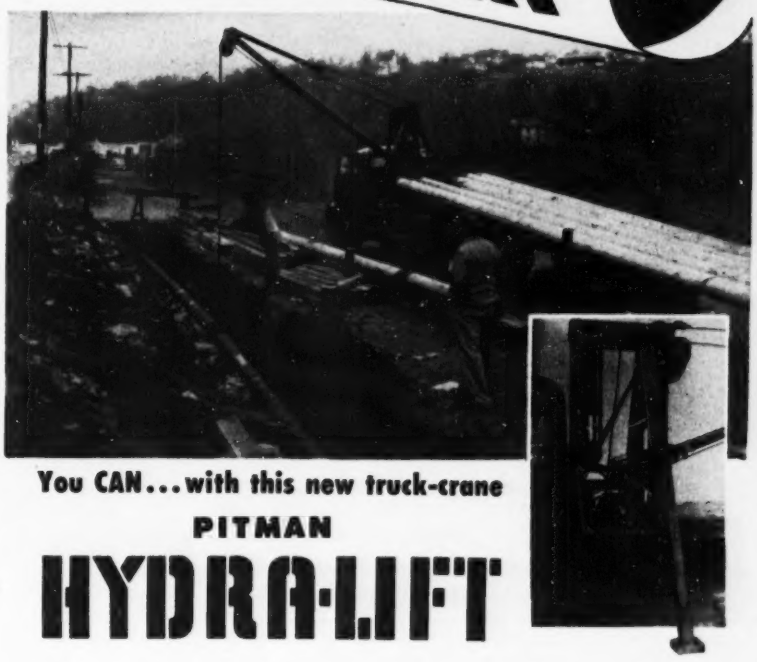

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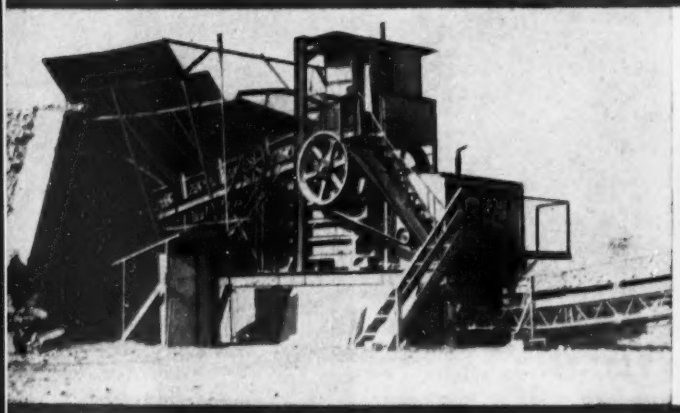
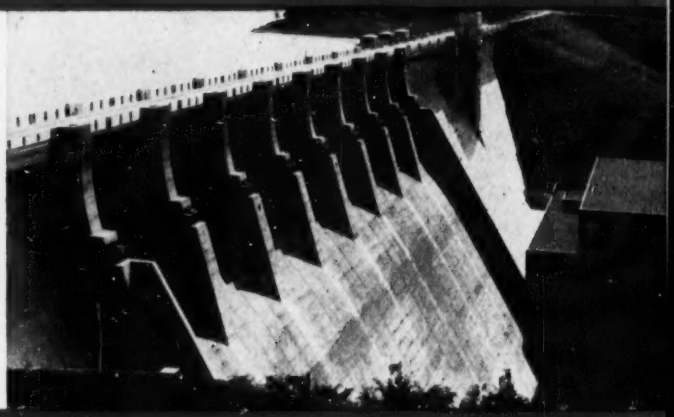
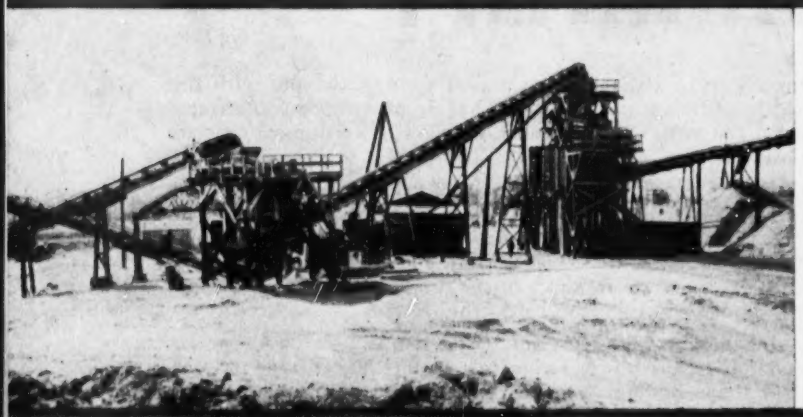


Telsmith helps build worn African airports

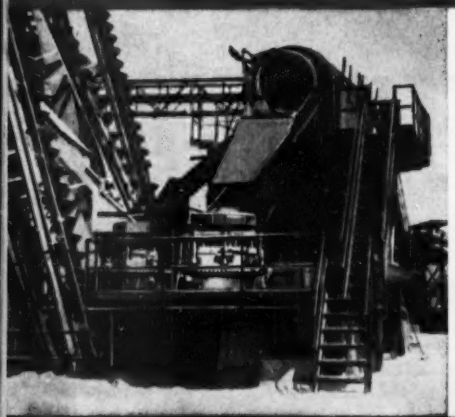


Aggregate plant built Center Hill Dam, Tennessee



200 tons per hour gravel plant in Wisconsin

2,500,000 tons of aggregate for Norfolk Dam, Ark.



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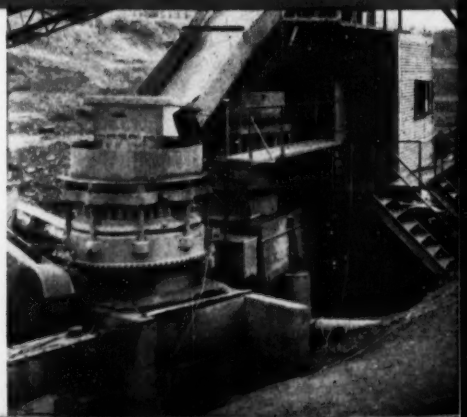

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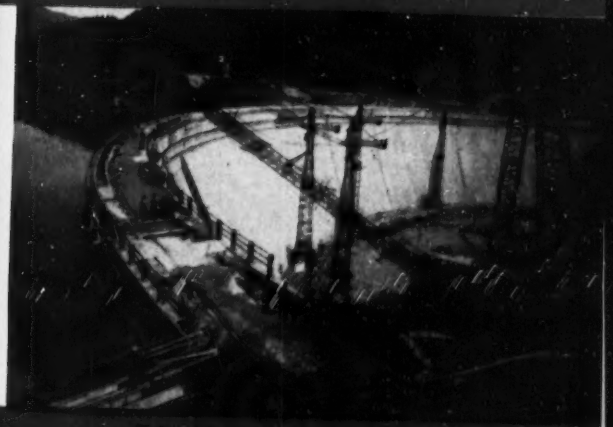

Telsmith helped build this Italian dam

Quarry plant at Warwickshire, England

Portable plant, building an airport in Alaska

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HOWARD LEWIS, superintendent of Golden sewage disposal plant, checks controls on pressure flotator unit.

the former produce the gas in less time.

• **Cheap fuel**—The gas, produced in the Coors-Golden plant at a rate of 15,000 cu ft per day, is stored in the secondary digester and is used to operate the boiler that heats the primary digester by steam injection. The secondary tank has a 34,000-lb floating steel top which maintains a six-inch gas pressure on all lines to gas-burning equipment in the control house.

•**Overload no problem**—The plant, designed for a 3-mgd capacity, now handles the combined brewery waste and town sewage at a rate of 1.5 mgd.

The primary digester, 35 ft in diameter by 30 ft deep, is constructed of concrete with an outer shell of buff colored hollow tile to match the exterior of the control house. Four inches of blown glass wool insulation were placed between the tile and the concrete for the 15 ft above ground level, and an insulating vapor seal of cork and asphalt was used for the portion below grade.

A tile drain was installed to intercept the ground water so that it would not carry away heat from the digester.

The flotator unit receives the sludge after it passes through the oxidator-clarifer. The central aeration compartment in the oxidator was designed

with an expanded (60 ft) diametrical dimension to obtain a greater reduction in BOD by providing longer aeration.

With flotation as an intermediate stage between the oxidator and the primary digester, sludge can be pumped from the oxidator even when it contains as little as 0.5% solids. The pressure flotation unit quickly concentrates the sludge to from 6 to 12%—this being done at the operator's discretion.

• **The purpose** of the flotator is to obtain a denser sludge, reducing the quantity of water handled in the primary digester. The sludge from the oxidator is super-saturated with air at the sludge pump, entering the flotation unit at 20 lb. back pressure. Upon reaching the flotator, the air is liberated suddenly, pulling the sludge to the top where the concentration of solids is scraped off and discharged into the primary digester.

Farrell said the "theory of pressure flotation is based on the fact that the amount of gas that a liquid will dissolve is directly proportional to the absolute pressure thereon. For example, at sea level, and at a temperature of 70 F, water will dissolve approximately two per cent of the air by volume. At 15-lb pressure, the solubility is approximately four per cent, and at 30 lb, six per cent, etc."

"When the pressure is released to atmosphere, the volume of air or gas present above saturation, is released, leaving the solution in the form of extremely fine bubbles. These bubbles attach to suspended matter and carry these solids to the surface as "float" for removal by skimming. This action may be compared with mechanical screening, the rising mass of bubbles corresponding to a screen with many infinitely small openings."

• **In other respects,** the plant is of the conventional type. The city sewage and brewery wastes are carried to the plant in a 24-in clay tile outfall sewer. This 1,988-ft line, constructed by the city of Golden, represented the municipality's only expense in connection with the plant's construction. The brewery wastes are pumped across Clear Creek with an eight-foot lift to the outfall sewer.

The flow passes first through a bar screen into grit chambers designed for one foot per second, and one minute detention at peak flow. The sewage then passes through twin comminutors, then through a Parshall flume for measuring, thence into the oxidator-clarifier.

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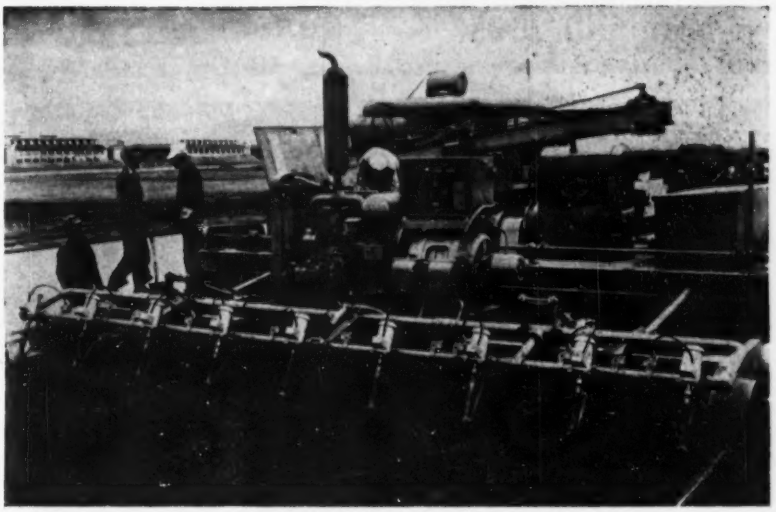

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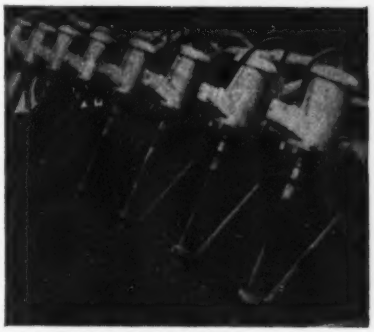
FERGUSON-VIBER full depth internal slab vibrator handles ¾ inch to 1 inch slump concrete in 20 inch slabs on Nebraska airport paving job.

To speed laying high strength uniform slabs up to 20 inches deep, using ¾ inch to 1 inch slump concrete, Abel-Dobson and Robinson of Lincoln, Nebraska, use 2 FERGUSON-VIBER full depth internal slab vibrators on their 340,000 cubic yard job at Lincoln Air Force Base, Nebraska. Thorough vibration makes it easy to handle a mix so dry it can be finished without delay. This keeps length of the equipment train down to a minimum and permits better supervision of working crews.



UNIFORM VIBRATION is assured for full width and depth of slab. (Note change in concrete after vibration). One man operates all hydraulic and electric controls.

These FERGUSON-VIBER paving vibrators were furnished complete with nine electrically driven three inch vibrators, an engine driven generator, and all control equipment mounted on an adjustable width framework towed by the spreader. They will handle any slab depth now designed.

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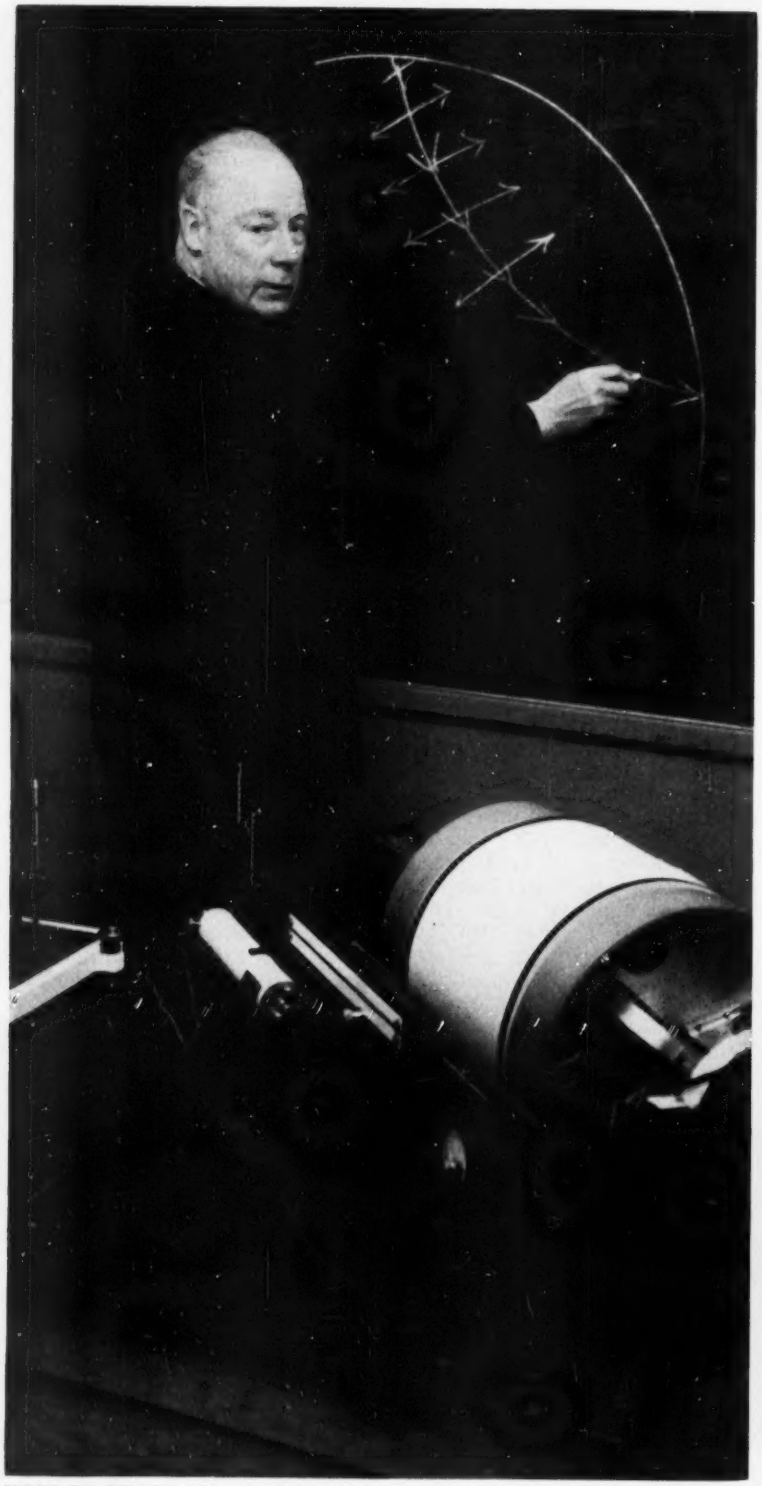
For information on the complete VIBER line of external and rubber-tipped internal vibrators, contact your authorized distributor or VIBER COMPANY, 726 South Flower Street, Burbank, California. Dept. 67



HOW TO TRACE AN EARTHQUAKE—Shock waves from the quake pass through the earth to reach an observatory. "Push" wave (long line) arrives first; "shake" wave (short lines) comes later. The interval sets distance of quake.

Father Lynch:

Somewhere handy to his desk, under the label "To be called in case of earthquakes," the city editor of every New York City newspaper keeps the name and number of a Jesuit priest. In the world's largest city, Father Joseph Lynch is the expert on seismological disturbances.

Up on the campus of Fordham University, in The Bronx, he teaches physics and operates an earthquake observatory (pictures). Based on solid rock 20 feet below ground level, his seismographs record the earth's quivers, from traffic vibrations on Fordham Road a few hundred feet away to more violent and infinitely more distant ripples from quakes in India or Japan.

At about 11:23 one evening last week, Fr. Lynch's phone started ringing. A mild earth tremor had just disturbed the Sunday rest of thousands of families in the New York City area, who had been reading of shattering earthquakes in the Ionian Islands of Greece. Some of them called Fordham. At almost the same moment, a reporter called up to say that there had just been a gas explosion down at the Brooklyn Navy Yard, and was it recorded on the instruments? Fr. Lynch was able to report that: (1) the tremor was caused by a very small earthquake a few miles off in New Jersey, and (2) that the Brooklyn explosion had not showed up on his seismographs.

He got more calls that night, some

MOTION of seismograph (lower left) is transmitted to photo paper on revolving drum by light beam.

He measures earth's tremors

from persons who thought they felt earthquakes, when what they really heard were fireworks celebrating the Feast of St. Rocco. But the fireworks, like the gas explosion, made no mark on Fr. Lynch's instruments.

The Fordham observatory is one of many maintained in the U. S. and other parts of the world by the Jesuits, who have been astronomers and meteorologists almost since the order was founded in 1534. Though seismology has been very much in fashion after disastrous earthquakes, like the one at Lisbon in 1755, it wasn't until about 1895 that the study was placed on a scientific basis. That was when an accurate seismograph was developed. Then along came the San Francisco earthquake of 1906, the worst one ever to have happened in the U. S. Within a few years after that quake, there were 16 Jesuit seismological stations in this country.

• **Earthquake data**—Construction men are well aware of these Jesuit stations and of others like them, which have provided the data that engineers have used to revise building codes in earthquake areas like California and Japan. Since an earthquake is a sudden slipping of the earth's crust, the main point in safe construction is to make sure that the structure will move as one block with its foundations when the slippage comes. Obviously, the nature of the foundation will have a lot to do with how much damage is done. That's why damage is least to buildings based on solid rock, and greatest when the ground is soft, particularly when it's fill.

What causes this slipping? Says Fr. Lynch: "It's a readjustment, taking place deep down in the earth's crust, to a change of forces. Blocks of earth are changing position because of a change in the pressures on them, caused perhaps by erosion, by the tides, by centrifugal forces, and other things. However, we don't yet know the full causes of these changing pressures."

• **Pendulum**—The seismograph is a delicately supported pendulum which remains stationary while the earth and everything connected with the earth moves. Of course, it's the pendulum which seems to move, while the earth apparently stays still. The motion of this pendulum is magnified electrically and recorded on photographic paper by a beam of light. The photo paper, attached to a slowly revolving drum (pictures), is marked off in time sequence so that the exact second of the quake's arrival is known.

By studying this paper, the seismologist can tell how far away the quake is. For an earthquake sends out two ripples: (1) a "push" wave that travels about five miles per second, and (2) a "shake" wave that twists the earth from side to side as it goes, at a speed of about three miles per second. The difference between the

ENR photos by Compton

MODEL of Fordham observatory shows solid rock slabs in underground chamber, on which seismographs are placed to record earth tremors.

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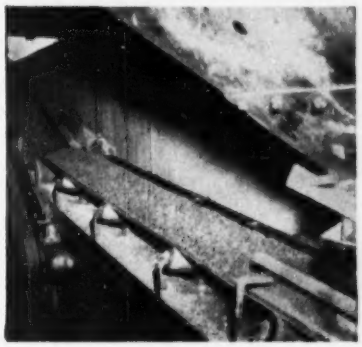
● Conveyor System For Meyer Coal & Material Co., Des Plaines, Ill.



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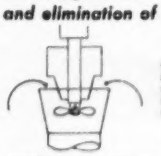
Effective, two-stage, sewage sludge digestion involves far more than just a heated tank! There are four major — and interrelated — requirements.

Here they are . . . and here's what you need to meet them . . .

1. Homogeneous mixing and elimination of scum



Calls for intensive mixing in the Primary by means of high-capacity propeller and draft tube.

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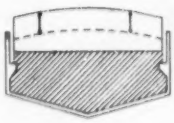
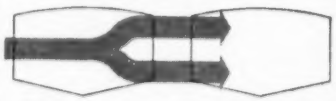
3. Adequate Gas Storage



Demands a Secondary equipped with a movable, steel dome gas holder to even out fluctuations and insure a constant supply to gas utilization equipment.

4. Simplified Control



Requires a simple and automatic means of transferring sludge and liquor from the Primary to the Secondary at rate of feed.

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time of arrival of these tremors establishes the distance which the quake is from the observatory.

By setting up three seismographs, one to record only motions from the north and south, one to record for the east and west, and one to respond only to an upward push or downward pull of the ground, a single observatory can tell the approximate direction of the quake. Its exact location can be plotted if two other observatories are consulted, by a method any artilleryman knows.

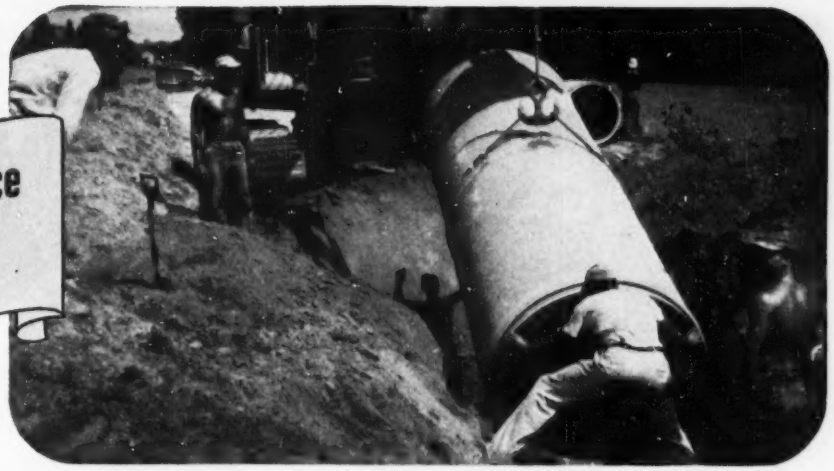
Once you know how far an unknown point is from each of three known points, you can quickly locate it by drawing three circles, with the observatories as centers and the distances as radii. Three circles can intersect at only one point—and that's where the quake is.

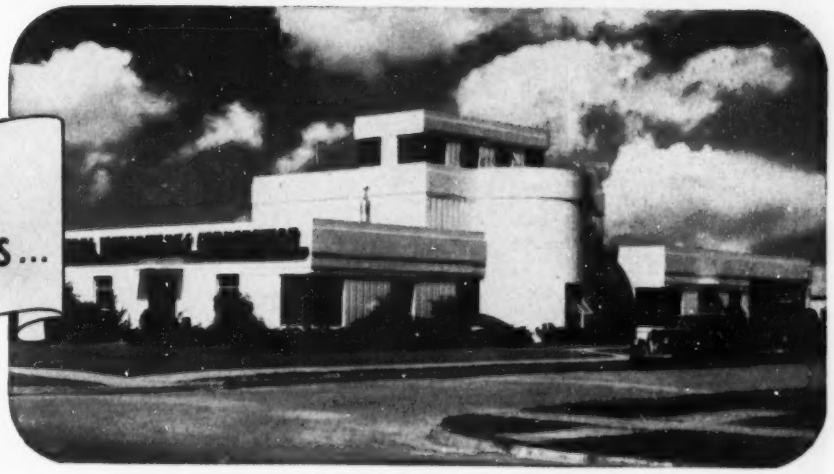
• **Wildcatting**—Seismology has its practical uses outside of the construction business. For instances, oil prospectors create small artificial earthquakes by setting off explosives in the ground, having first set up portable instruments at known distances from the center of the explosion. The time of arrival of the shock waves is recorded on these seismographs, providing clues to the structure of the ground. That gives an oil geologist something on which to work.

Besides helping strike oil, seismology has told geologists a good deal about the center of the earth. They know now, for instance, that it has a dense core of something like nickel or iron, starting about halfway down.

Seismologists are also working on—but have not yet found—a way of predicting when earthquakes will take place. As Fr. Lynch explains it: "We've noticed that in earthquake areas, the ground gradually rises for several years before a quake, much as the bladder of a football gradually rises through a tear in the cover before finally bursting. By observing this 'tilt,' we hope eventually to predict quakes."

The Fordham priest is now working on a project for the U. S. Navy to predict cold weather fronts. Seismologists have noticed a two-second ground wave recorded on their instruments whenever a cold front crosses the Great Lakes from further north. The cold front sets up water waves, which transmit a shock wave to the ground. Fr. Lynch is now trying to figure out just how the process works, so that this knowledge can be applied to general weather forecasting on the ocean and in the vicinity of large bodies of water.





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Using concrete in both water lines and waterworks buildings helps a community get good service and low rates for domestic and industrial users.

Concrete pipe has the durability that enables it to render long service in water lines. It has the strength to resist severe impact and carry heavy overburdens. It is not subject to internal corrosion resulting from tuberculation or electrolytic attack. This insures constant hydraulic efficiency. Concrete pipe stays clean, too, thus minimizing taste and odor problems and the unsightly staining of enamel plumbing fixtures. And the tight joints plus the uniformly dense structure of concrete pipe assure satisfactory watertightness.

Architectural concrete is ideal for waterworks structures. As in the Pine Bluff, Ark. General Waterworks plant shown above it can be used to create buildings that are both functional and distinctive. Such buildings stand out as symbols of sanitation and good management and are a source of community pride. Architectural concrete meets all structural requirements for durability, fire-safety and strength and can be molded economically into ornamentation of any style or period.

Concrete is economical construction both in water lines and waterworks buildings. It is moderate in first cost, costs less to maintain and lasts longer. The result is ***low-annual-cost*** service.

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Lithographed on stone for U. S. Pipe and Foundry Co. by John A. Noble, A. N. A.

THIS ILLUSTRATION shows the laying of cast iron pipe in the business section of a small town, which could be for water, gas or sewerage service. Such a situation calls for a pipe with proved long life to be placed beneath the costly permanent pavement. Whether in the business district, residential area or the country, cast iron pipe has established an enviable record of low cost per service year.

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INTERNATIONAL

Rubber reservoir

Leakage through cracks stopped with elastic lining

A huge rubber bag, large enough to hold 12,000,000 gallons of water, will form the lining of a reservoir near Sunderland, England. The reservoir, a concrete basin, is in a coal mining region and the underground works have caused repeated cracks in the existing concrete.

The lining will be placed in one of two 300x360x18-ft deep concrete tanks. Nearly a ton of adhesive will be used to apply 16,000 sq yds of rubber ¼ in. thick.

When the reservoirs were built on a clay base underlaid by sand pockets across a hard igneous rock (whinstone) ridge, mining engineers thought that coal deposits on each side of the ridge would have been cindered by the formation of the igneous rock ages ago. They believed that the cindering of the coal would prevent any settling of the reservoir foundations when the coal seams were worked.

Unfortunately this was not so, and working the coal caused repeated cracks in the concrete reservoirs. Repairing the cracks continually with inelastic materials did not prevent their opening up again and again.

Leakage through these cracks was particularly serious since the sand

Wide World Photo

DESTRUCTION OF ZAKINTHOS, a Greek island-city, was caused by earthquakes which brought death and destruction to three Ionian Sea islands on the west coast of Greece. On arriving at the island of Keffallinia with food and medical supplies, the U. S. heavy cruiser Salem radioed this description to London: "All villages on the island of Kefallinia leveled except for reinforced concrete construction which shows serious cracks." More than 1,000 persons have been killed and some 120,000 left homeless in one of the most extensive natural catastrophes of recent years.

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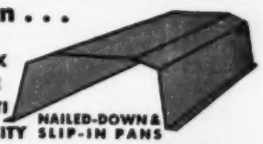

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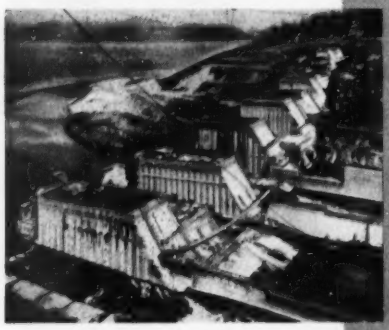

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pockets under the clay could be washed away. The only final solution of the problem was a waterproof elastic lining.

The rubber linings are being made by the Dunlop Rubber Company of England.

African aluminum

Gold Coast mining and hydro work projected on Volta River

By developing the resources of bauxite and water power along the Gold Coast's Volta River, the United Kingdom and the Gold Coast governments, along with various Canadian and British aluminum companies, plan to establish large-scale aluminum production in Africa.

The newly formed National Committee for the Volta River Project will send a delegation to Canada in September to assist Canadian companies in their planning of the estimated $390-million project.

The Volta River plan falls into three parts. The first involves construction of a dam and power station with a 2,000-sq mile reservoir at Ajena, 70 miles from the mouth of the Volta. Power would be available from five to seven years after the work begins.

The second part of the plan centers around smelting facilities with an annual capacity of 80,000 tons, eventually increasing to 210,000 tons. The known reserves of bauxite on the Gold Coast exceed 200,000,000 tons. The smelter will be built at Kpong, 12 miles south of Ajena.

The final section of construction in the plan will be extensive railway building, new and increased port facilities, roads, houses, and various other public works.

Sir William Halcrow and Partners of London, are consulting engineers to the Volta River Project.

International briefs . . .

• **Bridge for Bosporus**—A spokesman for West Germany's Krupp combine reports that Bosporus bridge plans submitted to Turkey by his organization constitute "nothing more than an idea" of how such a structure could be built. The plan suggested by Krupp's bridge building division: a 4,920-ft single span suspension bridge to carry auto and pedestrian traffic between

Asiatic and European parts of Istanbul. Financing the four-year, $71-million project is regarded as the main problem. But bridge or no, the proposal reflects the increasing action by German engineers in obtaining Middle and Near East contracts.

• **Egyptian land reclamation**—Egypt and the U. S. are embarking on a $25-million program to reclaim 80,000 acres of desert-delta wasteland. Two objectives of the four-year plan: using the Nile River to irrigate water-short Fayoum, a semi-oasis desert southwest of Cairo; building pumping stations for irrigation-drainage canals in water-laden Behera, a former river bottom site in the delta region south of Alexandria. Egypt will finance $15 million of the project; the U. S., under the Point-4 technical assistance program, will contribute $10 million.

• **Tignes Dam dedicated**—Europe's tallest dam—the 592 ft Tignes project situated in the French Alps on the glacier-fed Isere River—was dedicated recently marking completion of three years' construction work by L'Entreprise Industrielle de Paris. As a beginning, Tignes' waters will feed two power plants—one just down stream, the other nine miles below—with a combined annual output of from 543 to 700 million kwh. (ENR, Dec. 13, 1951, p. 30.) The development is a project of Electricite de France.

• **African power expansion**—The Export-Import Bank has granted the Rhodesia Congo Border Corp. a $22.4-million loan to extend thermal power stations of four Northern Rhodesia copper-cobalt mining companies. Proceeds from metal sales to the U. S. Defense Materials Procurement Agency will be used to repay the loan. To meet the still heavier load expected in the area by 1957—when new mines come into full production—Katanga, Belgian Congo, has agreed to supply additional power from hydro-electric installations on the Lualaba River at the rate of 57,000 kw for five years.

• **Caribbean highway circuit**—Mexico has put four road construction crews to work on its southeastern jungle in Yucatan to provide the missing link in a proposed new Caribbean highway route. When this 200-mile stretch is completed in mid 1955—at a cost of $35 million—U. S. tourists will be able to drive south through Mexico to the Yucatan peninsula. Thence—at Puerto Progreso—cars will cross by ferry to Cuba, continue to Havana, end the circuit by being ferried to Miami, Fla.

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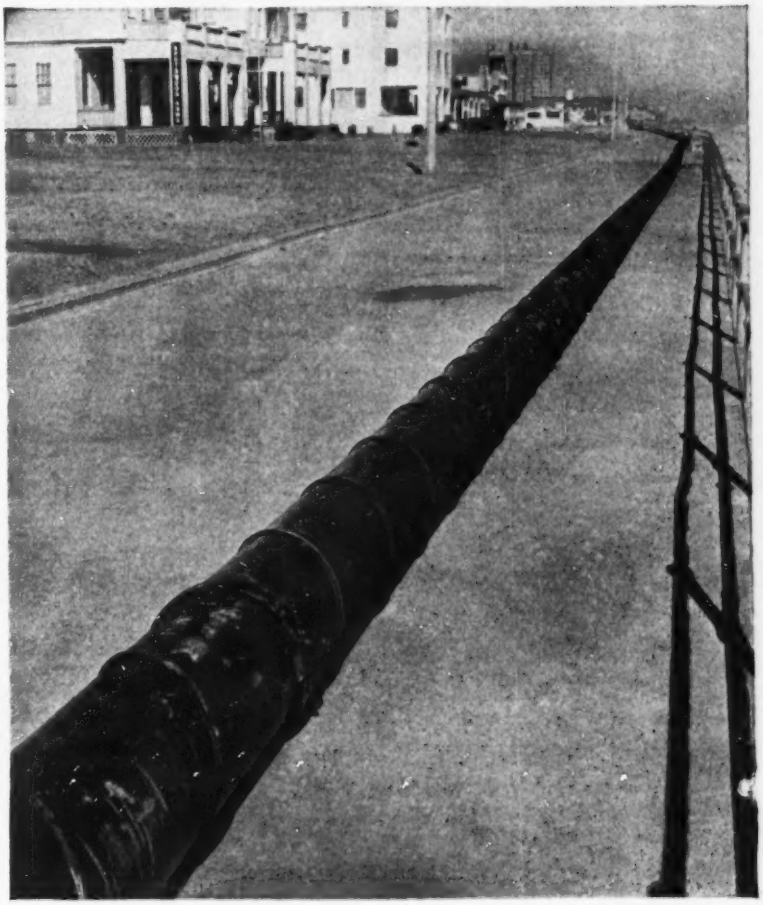

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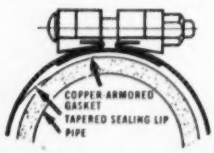

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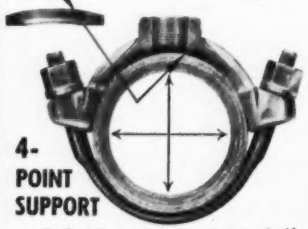

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OBITUARIES

Charles R. Locker, 41, a civil engineer who formerly made his home in Erie, Pa., died Aug. 6 in Bermuda where he had been employed by the U. S. Navy for the last two years. Prior to the Bermuda assignment, he had been a civil engineer in Alaska with the U. S. Army.

Edward J. Martin, Jr., 51, a consulting construction engineer died July 30 at Dobbs Ferry, N. Y. He was a Cornell graduate and for 15 years was village engineer of Irvington, N. Y. and for 10 years held a similar position for North Tarrytown, N. Y.

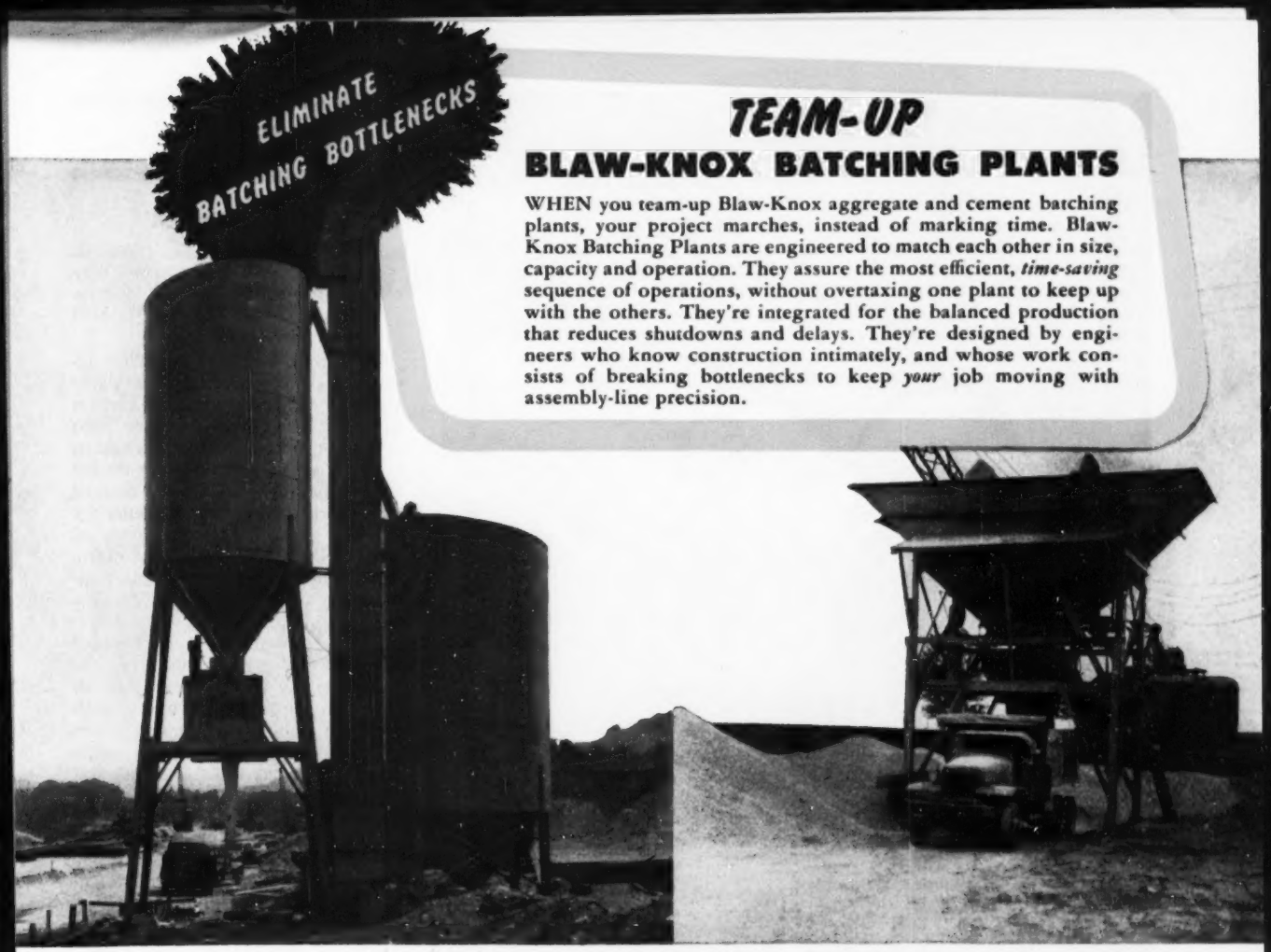
George L. Bennett, 79, a retired civil engineer died Aug. 10 at New Milford, Conn. Among other jobs, Bennett assisted in the design of the reservoir system for New York City in 1912. He was a graduate of Columbia University and retired in 1946.

Lt. Col. Harvey B. Schell (Ret.), 53, at one time district engineer at Milwaukee, Wis., for the Army Corps of Engineers, died there Aug. 4. He was commissioned in the Engineers in 1931 and served with the Civilian Conservation Corps; as executive officer to the post engineer at Camp McCoy, Wis.; and was a member of the Nagasaki military government team in Japan, in addition to his Milwaukee post.

Paul E. Jeffers, 64, Los Angeles structural engineer and authority on earthquake resistant construction, died Aug 7 in Los Angeles. Jeffers was president of the State Board of Registration for Civil and Professional Engineers, a position he had held since 1947.

A graduate in civil engineering of Stanford University, he founded the Structural Engineers Association of Southern California and served as its first president in 1929. He lectured in engineering at the University of California at Los Angeles. He opened his own office in 1919 and did the structural design on many Southern California buildings, including Santa Anita Racetrack and the new office building which was constructed for the Southern California Gas Company.

Walter L. Richardson, 71, professional engineer of Seattle, died there Aug. 6. A past president of the Washington State Chapter of Professional Engineers, he long had been associated with the Stone & Webster Engineering Corp.



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BLAW-KNOX BULK CEMENT PLANTS

The Model BCPC 400-B Portable Bulk Cement Plant illustrated above has 400-bbl. storage over the electrically interlocked Weighing Batcher, and 400-bbl. ground storage over the conveyor screw. Bins are interchangeable and the tank portion is one-piece welded construction with symmetrical base plates. The round bin design assures the utmost portability and speed of erection. Available with 200-bbl. or 400-bbl. bins and in combinations which double these capacities.

BLAW-KNOX AGGREGATE BATCHING PLANTS

The Blaw-Knox 100-ton 3-compartment Portable Aggregate Plant shown above is equipped with a 1¼-yd. Automatic Weighing Batcher for loading batch trucks. Filling gates are opened in sequence by a single electric motor which is intermittently energized by simple automatic control in the dial stand. Portable Batching Plants are available in 2, 3 and 4-compartment styles and in capacities ranging from 100 to 120 tons. Aggregate Weighing Batchers, both conventional and twin types, are included.

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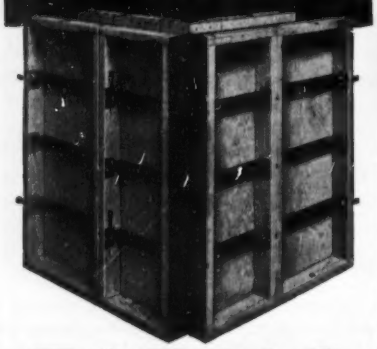

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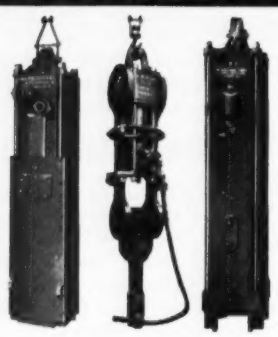

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BOOKS

Valuation bible revised

ENGINEERING VALUATION AND DEPRECIATION—By Anson Marston, Robley Winfrey and Jean C. Hempstead. 508 pp. McGraw-Hill Book Co., 330 W. 42nd St., New York 36, N. Y. $8

This book represents a major revision of the text ENGINEERING VALUATION by Anson Marston and Thomas R. Agg first published in 1936. Both original authors of what is considered by many as the best reference on the subject are now deceased. Planning the new edition was started under the direction of Prof. Marston before he died in 1949, but, the actual execution of the new edition is almost entirely the work of Professors Winfrey and Hempstead.

The new edition gives much added emphasis to depreciation as the change in the title implies. Four of the eighteen chapters are on depreciation with emphasis on applications to valuation work. The authors introduce an approach to depreciation that separates the cost, value and accounting concepts of the subject.

Other property appraisal tools are brought up to date. These include cost indexes and methods of estimating average service life of physical property groups. In general, it appears that the revision of the book will make it even more useful for either text or reference use.

Rigid frame design

STEEL RIGID FRAMES MANUAL DESIGN AND CONSTRUCTION—By Martin P. Korn. 170 pp. J. W. Edwards, Inc., Ann Arbor, Mich.

Neither a handbook nor a textbook in the usual sense, this volume is principally a critique of rigid-frame design. Ardently advocating welding, it offers discussions, photographs and detail drawings of many of the outstanding steel rigid frames built to date. Some of the discussion was written by prominent engineers—A. Amirikian, A. G. Hayden, J. F. Willis, to mention a few.

The book also contains tables presenting bending moments at crown and knees, thrusts and vertical reactions for spans of 50 to 150 ft. These are limited in application, however, to symmetrical rigid frames with rafters and columns of constant moment of inertia and of about the same dimensions. They would be useful, though, for preliminary designs of other types of frames.

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METAL THICKNESS: 0.032 inch (22 U.S. Std. Ga.)

FINISH: Embossed.

LENGTHS: 5', 5' 6", 6', 6' 6", 7', 7' 6", 8', 8' 6", 9', 9' 6", 10', 10' 6", 11', 11' 6", 12'. (Special lengths cut to order subject to inquiry.)

WIDTH: Over all width 48⅛", nominal coverage 45½", 1½ corrugations side lap.

CORRUGATION: Pitch 2.667" center to center, depth ⅞", 18 crowns, 18 valleys, one edge up, opposite edge down.

WEIGHT: 56 pounds per 100 square feet of formed sheet.

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Bids Asked—Low Bidders—Contracts Awarded—First Section—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager
J. A. MAHONEY, M. O. WETZEL, L. M. WINISKI, M. E. SCIORRA, F. S. DEMBEK, Reports.
J. H. WEBBER, M. R. ROESSLER, E. R. HUBER, Statistics.

NEW ENGLAND

BIDS ASKED—BUILDINGS

Conn., Waterbury—SCHOOL—B.A. 9/2—City, Dr. J. J. Gilmartin, supt. Schools, Bd. Educ., Crosvy H. S., Waterbury, Wilson School addn., alterations, $350,000. Plans deposit $350. F. L. S. Mayers, 126 Bedford St., Stamford, archt. CD 6/2.

SOON LETS CONTRACT—BUILDINGS

Conn., Stafford Springs—HOSPITAL—Johnson Memorial Hospital, Inc., 37 East St., soon lets contract hospital alterations, 37 East St. $425,000. Irving W. Rutherford, 49 Garden St., Hartford, archt. Walter J. Douglas Assoc., 628 Flatbush Ave., West Hartford, structural engrs. CD 4/22.

▲ **R.I., Providence**—GYMNASIUM—Providence College, River Ave., soon lets contract 190x235 ft. brick, limestone gymnasium. $2,000,000, Eggers & Higgins, 100 E. 42 St., New York, N. Y., archts.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **MASSACHUSETTS**—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston,
Campanella & Cardi Constr. Co., 780 Jefferson Blvd., Warwick, R. I. CA **$1,645,999,** est. $1,500,000. bridge constr. Middlesex Pike, Rte. 3, Burlington. Bids July 28, awarded Aug. 11. CD 7/31, under LB.
MASSACHUSETTS—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston,
Daniel O'Connell & Sons, Inc., 40 Hampden St., Holyoke, Mass. CA **$798,749,** est. $800,000. state hy. and bridge constr., West Springfield. Bids Aug. 4, awarded Aug. 11. CD 8/10, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

City, Bureau Purchases, Hall Records, 200 Orange St., New Haven, Conn., rejected bids July 20, POLICE ACADEMY and GARAGE, Sherman Parkway, NEW HAVEN, CONN. LB. **$431,000.** Will re-advertise. CD 7/27, under LB.
Berkshire Constr. Co., 123 Norman St., Bridgeport, Conn., LB, **$630,000,** Long Lots Junior High SCHOOL, Hyde Lane, WESTPORT, CONN. Town, G. E. Rast, supt. Schools, Westport, Conn. Bids Aug. 10. CD 7/31.
The Jarvis Constr. Co., 5 Dover Rd., Manchester, Conn., Owner Builds, **$300,000-$400,000.** 30-40 RESIDENCES off Elm St., WINDSOR LOCKS, CONN.

MIDDLE ATLANTIC

BIDS ASKED—HEAVY CONSTRUCTION

N. Y., Niagara Falls—B.A. 9/3—Harold R. Cheek, city mgr., City Hall, water treatment plant alterations south of Buffalo Ave. at 53 St., incl. Div. 14, structures; Div. 15, piping and equip.; Div. 16, electrical work; Div. 17, heating. Plans deposit $20. Greeley & Hansen, 220 S. State St., Chicago, 4, Ill., engrs.
New York—SUB-STATION—B.A. 9/4—New York City Transit Auth., 370 Jay St., Brooklyn, Zone 1, constr. Liberty Sub-station for Fulton Street Line in Queens, Contract 1, general construction; Contract 2, plumbing work. CD 8/31/45.
N. J., New Providence—B.A. 9/10—New Providence Boro, Springfield Ave., force main connecting with Summit System. $160,000.
Pa., Erie—B.A. 9/11—City, City Council Chambers, constr. relief and reinforcing sewers, Divs. B, C, D, E and F. Plans deposit $10 each. Fred A. Gorenflo, city engr. Consoer, Townsend & Assoc., 717 Liberty Ave., Pittsburgh, Zone 22, consult. engrs. CD 7/28.

BIDS ASKED—BUILDINGS

▲ **Pa., Uniontown**—GYMNASIUM—B.A. 9/3—Uniontown School Bldg., Auth., Uniontown, combination gymnasium and auditorium addns. $1,045,000. Emil Johnson, 24 Robinson St., archt. CD 9/17/52.

SOON LETS CONTRACT—BUILDINGS

▲ **Pa., McKees Rocks**—OFFICE, etc.—Continental Transportation Lines, Inc., McKees Rocks, soon lets contract office, shop bldg. and dock. $1,000,000. Charles M. & Edward Stotz, 801 Bessemer Bldg., Pittsburgh, archts.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

Harry C. Erb, Inc., 29 Bala Ave., Bala, Pa., CA, **$506,945** paving and fencing work, Philadelphia International Airport, PHILA., PA. Dpt. Procurement, City Hall Annex, Phila., Pa. CD 7/15, under LB.
H. T. Horst Constr. Co., Inc., 110 S. 10 St., Reading, Pa. LB **$106,157,** est. $80,000. altering water supply sys., 500,000 gal. reservoir, filter house alterations, renovate concrete reservoir, Wernersville State Hospital, WERNERSVILLE, PA. General State Auth., 18 and Herr Sts., Harrisburg, Pa. Bids Aug. 12. CD 7/22.
MARYLAND—State Rds. Comn., 108 E. Lexington St., Baltimore,
Bero Engineering & Constr. Co., Box 477, Hampton, Va. CA **$691,955.** grading, drainage, surf. 1.881 mi. U.S. Rte. 40, Contr. 537-5-715 and CL 308-3-715, near Ridgeville, Carroll and Frederick Counties. CD 7/28, under LB.
Patapsco Engineering Co., Inc., 10 E. Cromwell St., Baltimore, Md. LB **$135,120.** surf. 1.4 mi. State Rte. 298, near Lynch, Q 277-215, Queen Anne Co. Bids Aug. 11. CD 7/28.

BUILDINGS

LOW BIDS AND CONTRACTS

Upper Darby School Bd., Clifton Heights, Pa., rejected bids Westbrook Park Grade SCHOOL, CLIFTON HEIGHTS, PA. LB **$505,000.** Will re-advertise. CD 8/6, under LB.
▲ **Moyer Bros.,** 2605 Beale Ave., Altoona, Pa. CA **$1,439,849.** 2 story brick, block, steel frame Junior-Senior HIGH SCHOOL, CURWINSVILLE, PA. Central Clearfield County Joint School Auth., Curwinsville, Pa. Bids May 1. CD 4/20.
▲ **H. Platt Co.,** 1104 Selinger Ave., Erie, Pa., CA **$1,000,000.** MFG. BLDG., hospital and surgical equip., ERIE, PA. American Sterilizer Co., 1230 Plum St., Erie, Pa.

SOUTH

BIDS ASKED—HEAVY CONSTRUCTION

† **Fla., West Palm Beach**—FUELING UNIT, etc.—B.A. On Or About 9/22—U. S. Eng., P.O. Box 4970 Jacksonville, wattpar aerocell fueling unit and sealing interiors of 4 buildings, Palm Beach International Airport, Palm Beach Co., about 2.5 mi. west of here, Serial No. Eng-08-123-54-15.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† **Diamond Constr. Co.,** 4725 Shore Dr., Norfolk, Va. LB **$7,884,000.** ammunition loading piers, etc., U. S. Army Ammunition Loading Terminal, Sunny Point, ENG-31-075-53-21, WILMINGTON, N. C. U. S. Eng., 308 Customhouse, Wilmington, N. C. Bids Aug. 13. CD 8/5.
KENTUCKY—State Hy. Dpt., Frankfort,
Fuller-Davies Co., Frankfort, Ky. LB **$110,796.** bit. surf. class I and traffic bound river grav. 2.168 mi. Sparta-Sanders Rd., S 394 (2), SP 39-213, RS 39-213, Gallatin Co.;
Winston Ford Co., Prestonburg, Ky. LB **$134,809.** traffic bound limestone (steel piling) 5.077 mi. Stricklett-Triplet Rd., S 148 (3), RS 68-234, Lewis Co.;
Monroe-Cumberland Cr. St. Co., Burkesville, Ky. LB **$90,399.** bit. surf. Class C-1 9.605 mi. Stearns-Monticello (Ky 92) Rd., SP 74-93, McCreary Co.;
Licking River Limestone Co., West Liberty, Ky. LB **$79,945.** traffic bound limestone 4.17 mi. Dingus-Relief Rd. (Ky 437), SP 88-258, Morgan Co.;
J. C. Wells & Sons, Inc., Morehead, Ky. LB **$93,912.** reconstr. traffic bound limestone 5.466 mi. Bald Hill-Hillsboro Rd., RS 35-690, Fleming Co.;
L. E. Borgin, Covington, Ky. LB **$71,401.** bit. surf. Class C-1 12.09 mi. Bethel Ridge-Science Hill Rd., RS 23-21, and Jacktown-Gravel Switch Rd., RS 23-161, Casey Co. Bids Aug. 7. CD 7/24.

BUILDINGS

LOW BIDS AND CONTRACTS

Pettus Constr. Co., P.O. Box 9697, Richmond, Va. CA **$568,713.** John B. Cary SCHOOL, RICHMOND, VA. Richmond School Bd., 312 N. Ninth St., Richmond, Va. CD 8/14, under LB.
▲ **R. F. Ball Constr. Co.,** P. O. Box 1057, San Antonio, Tex. CA **$11,221,305.** Desire Street HOUSING Proj. LA 1-14 Sects. 2, 3 and 4, NEW ORLEANS, LA. New Orleans Housing Auth., 1111 Tulane Ave. New Orleans, La. CD 6/22, under LB.

MIDDLE WEST

BIDS ASKED—BUILDINGS

▲ **Ill., Elmhurst**—SCHOOL—B.A. 9/3—School Dist. No. 88, 355 W. Charles St., York Community High School, $1,600,000, Childs & Smith, 20 N. Wacker Dr., Chicago, Zone 6, archts. CD 12/17/51.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **OHIO**—State Hy. Dpt., Columbus, Zone 15,
Frysinger Constr. Co., 16 E. Broad St., Columbus, O., CA, **$723,787,** Type T-71 and structure 2.183 mi. USR 25-15-84; USR 30N-20.08 FI 963 (2) F-476 (11), Allen Co.;
The Great Lakes Constr. Co., Box 2278, Brooklyn Sta., Cleveland, O., CA, **$1,288,695,** Type T-35 and structures 7.543 mi. USR 42 (4.80-11.84), A-FI-UI 83 (2) (City of Parma) (Villages of Parma Heights, Middleburg Heights and Strongsville), Cuyahoga Co.;
Launder & Son, Inc., Station E, Box 6, Toledo, O., CA, **$507,950,** Type T-50, 1.703 mi. SR 120 (21.54-22.13) 0.00 A-U 399 (4), Lucas and Wood Counties. Grand total, $2,520,432. Bids July 28. CD 8/4, under LB.
▲ **ILLINOIS**—State Div. Hys., Springfield,
O'Connor Constr. Co., 320 Reisch Bldg., Springfield, Ill., CA, **$549,961,** c. conc. 5 mi. U. S. 66, Logan Co.;
Leininger Constr. Co., 30 N. LaSalle St., Chicago, 3, Ill., CA, **$1,039,471,** c. conc. 8.11 mi. U. S. 66, McLean Co. Bids July 17, awarded Aug. 12. CD 7/22, under LB.
▲ **John J. Keeley Contg. Co.,** 2030 State St., East St. Louis, Ill. LB **$1,229,152.** Sect. 1 main trunk sewer in Ohio Ave. 24 to 34 Sts.;
Joseph P. Keeley Contg. Co., 648 N. 42 St., East St. Louis, Ill. LB **$160,400,** Sect. 2; LB **$520,132,** Sect. 3; LB **$279,275,** Sect. 4;
Keeley Brothers Contg. Co., 4211 State St., East St. Louis, Ill. LB **$83,266,** Sect. 5; LB **$220,072,** Sect. 6; LB **$241,517,** Sect. 7; LB **$91,420,** Sect. 8; LB **$143,789,** Sect. 10; LB **$131,263,** Sect. 11; LB **$180,400,** Sect. 14;
Cardinal Constr. Co., Inc., 4301 State St., East St. Louis, Ill. LB **$280,878,** Sect. 12; LB **$220,041,** Sect. 13, EAST ST. LOUIS, ILL. City, Alvin G. Field, mayor, City Hall, East St. Louis, Ill. Bids Aug. 5. CD 7/7.

BUILDINGS

LOW BIDS AND CONTRACTS

E. W. Sproul Co., 137 W. Madison St., Chicago, Ill., CA Est. **$400,000,** general contract 2 story brick, RECREATIONAL CENTER Addn., VALPARAISO, IND. Valparaiso University, Dr. O. P. Kretzman, pres., Valparaiso, Ind. Hare & Hatch, 125 Broad St., New York, N. Y., archts.
▲ **American Community Builders, Inc.,** (Sponsor), Park Forest, Ill. Own Forces, $1,000,000, construct, manage and finance, 37 duplex RESIDENCES for Personnel of Joliet Arsenal, JOLIET, ILL. Loebl, Schlossman & Bennett, 430 N. Michigan Ave., Chicago, Ill., archts.
▲ **American Community Builders Inc.,** (Sponsor) Park Forest Ill., Own Forces, **$1,000,000,** construct, manage and finance, fifty 1 story frame, brick RESIDENCES, FORT SHERIDAN, ILL. Loebl, Schlossman & Bennett, 430 N. Michigan Ave., Chicago, Ill., archts.
▲ **Kroening Engineering Corp.,** 4400 W. Mitchell St., Milwaukee 14, Wis. CA **$1,789,355.** excav., grading, concrete, masonry, carpentry work, Northwest Senior

PROJECTS COVERED

Projects—By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $34,000; other public works $60,000; industrial buildings $82,000; other buildings $300,000.

Classes of Construction

(Name in order of Listing)

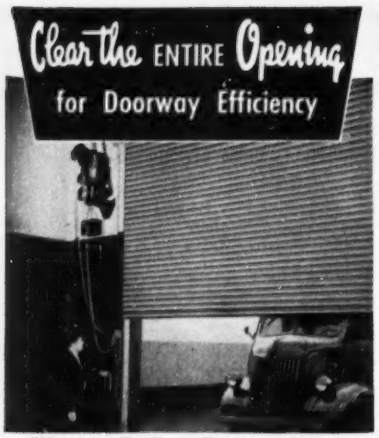
Water Supply
Sewers, Waste Disposal
Bridges
Streets & Roads
Earthwork, Waterways
Latin America
Public Buildings
Commercial Buildings
Industrial Buildings
Unclassified

Stages Reported

PROPOSED WORK: Including appointment of engineers or architects.
BIDS ASKED (new announcements only). For full calendar, see also preceding issues of ENR.
LOW BIDDERS: On jobs below $500,000 value all low bidder news will be the final reports published on the projects invloved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.
CONTRACTS AWARDED: Except awards to low bidders previously reported in low bidder stage.
Dates shown are of issue in which last previous report was published.

Symbols and Abbreviations Include:

† Federal Government
▲ Project of $1,000,000 or over.
B.A. Bids Asked
ENR Engineering News-Record
CD Engineering News-Record Construction Daily



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HIGH SCHOOL, MILWAUKEE, WIS. Bd. School Directors, 1111 N. 10 St., Milwaukee 3, Wis. Bids July 30, awarded Aug. 13. CD 7/27 under LB.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION

▲† **Tex., Bryan**—RUNWAY—B.A. 9/10—U. S. Eng., 100 W. Vickery St., Fort Worth, 7,000 ft. runway, connecting taxiways, parking apron, Bryan Air Force Base, ENG-41-443-54-4. CD 3/38/51.

BIDS ASKED—BUILDINGS

▲ **Okla., Tulsa**—COURT HOUSE—B/A. 9/10—Tulsa Co., Court House, 12 story court house, jail and equip. $3,500,000. Plans deposit $500. Black & West, Tri-State Bldg., archts. CD 7/30/52.

▲ **Tex., Austin**—HOSPITAL—B.A. 9/10—St. David's Community Hospital, 606 W. 17 St., 3 story, 65,000 sq. ft., 100-bed rein.-con., brick hospital. $1,420,000. Extended date. Page, Southerland & Page, 602 West Ave., and Wm. R. O'Connell, 305 Perry-Brooks Bldg., archts. CD 7/28.

▲ **Tex., Austin**—HOSPITAL—B.A. 10/6—City, Walter Seaholm, city mgr., City Hall, 1, 3 and 6 story Breckenridge Hospital addn., remodeling present bldg. and service bldg. $1,500,000. Giesecke, Kuehne & Brooks, Perry-Brooks Bldg., C. H. Page & Son, 305 W. 11 St., and Niggli & Gustafson, 4303 Avenue F, assoc. archts. CD 7/22/52.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

Oklahoma Constr. Co., Barnes Bldg., Muskogee, Okla. LB $568,471, est. $700,000. grading, drainage, storm sewers for Fair Grounds.

FAR WEST

BIDS ASKED—HEAVY CONSTRUCTION

▲ **Calif., Los Angeles**—B.A. 9/10—Metropolitan Water Dist. of South Calif., 306 W. 3 St., West Orange County Feeder, 8.68 mi. 43-in. diam. pipe line, $2,000,000, R. Diemer, engr.

▲ **Calif., Los Angeles**—B.A. 9/11—Los Angeles County Flood Central Dist., 2250 Alcazar St., Proj. 18 Firestone, Downey Storm Drain, South Gate, $1,085,600. Plans deposit $3.60. CD 11/7.

▲ **Calif., Los Angeles**—B.A. 9/18—Los Angeles County Flood Control Dist., 2250 Alcazar St., Proj. 146 Central Ave. Glendale Ave. and portion of Proj. 60 Tropico Storm Drain, Glendale, $1,500,000, H. E. Hedger, engr. CD 11/7.

BIDS ASKED—BUILDINGS

▲ **Wash., Spokane**—CIVIC AUDITORIUM—B.A. 9/17—City, City Hall, civic auditorium, $2,000,000. Extended date, Whitehouse & Price, Hutton Bldg., archts. CD 8/11.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† **Allis-Chalmers Mfg. Co.,** 1126 S. 70 St., Milwaukee, Wis. CA $2,005,378. two banks of 345,000 volt auto-transformers for McNary-Ross line, Klickitat and Skamania Counties, Inv. 7021, WASHINGTON. Bonneville Power Admin., 827 N. E. Oregon St., Portland, Ore. Awarded Aug. 14. CD 6/16, under LB.

▲ **Kemper Constr. Co. & MacDonald & Kruse,** 3701 Overland Ave., Los Angeles, Calif. LB $2,326,868. Sect. 1;

John B. Artukovich Sons, Inc. & Artukovich Bros. Investment Co., 16200 S. Atlantic St., Paramount, Calif. LB $1,019,892. Sect. 2;

Vido Artukovich & Son, Inc. & Papac Constr. Co., Inc., 11255 E. Rush St., El Monte, Calif. LB $1,333,059, Sect. 3;

Matt Zaica, 6828 Farmdale St., North Hollywood, Calif. LB. $848,651. Sect. 4, LaCienega and San Fernando Valley Relief Sewer Unit A (outfall sewer), LOS ANGELES, CALIF. City, City Hall, Los Angeles, Calif. Bids Aug. 12. CD 7/7.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Orangeglen Homes, Inc.,** 2208 W. Beverly Blvd., Los Angeles, Calif. Owner Builds. $1,487,200. 227,940 sq. ft. stucco DWELLINGS, AZUSA, CALIF.

▲ **Van Owen Estates,** 6338 Wilshire Blvd., Los Angeles, Calif. Owner Builds. $2,360,000. 236 stucco DWELLINGS, Comanche, Laramis, Koekuk, Fullbright and Delco Aves., CANOGA PARK, CALIF. Seaborg Engr. Co., 8844 W. Olympic Blvd., Beverly Hills, Calif., engr.

ALASKA

BIDS ASKED—HEAVY CONSTRUCTION

† **Alaska**—ROADS, STREETS, etc.—B.A. 9/16—U. S. Eng., 3013 Arcade Bldg., Seattle 1, Wash., roads, streets, parking areas, sidewalks, involving 420,000 sq. yd. asphaltic concrete, 9,000 sq. yd. concrete paving, 42,000 sq. yd. cement concrete sidewalks, Eielson Air Force Base, ENG-95-507-54-5. Plans deposit $50. CD 11/25.

† **Alaska, Fort Richardson**—B.A. 9/18—U. S. Eng., 3013 Arcade Bldg., Seattle 1, Wash., paving roads, streets, parallel sidewalks, constr. outside utilities to serve family housing, POL lab., etc. ENG-95-507-54-14. Plans deposit $75. CD 11/25.

BIDS ASKED—BUILDINGS

†-**Alaska, Fort Richardson**—STORAGE IGLOOS—B.A. 9/15—U. S. Eng., 3013 Arcade Bldg., Seattle 1, Wash. 39 sixty ft. rein.-con. ammunition storage igloos, 7 cement concrete storage pads, 8,500 lin. ft. access road, ENG-95-507-54-7. Plans deposit $10. CD 11/25.

†-**Alaska, St. George Island**—HOSPITAL, SHOP, etc.—B.A. 9/15—Fish & Wildlife Service, Dpt. Interior, 706 Federal Office Bldg., Seattle 4, Wash., hospital, boat and carpenter shop, equip. bldg., Inv. No. FWC-660.

†-**Alaska, Whittier**—SHOP—B.A. 9/15—U. S. Eng., 3013 Arcade Bldg., Seattle 1, Wash., 65,000 sq. ft. masonry composite shop, Inv. 54-28. Plans deposit $25. Naramore, Bain, Brady & Johanson, 904 Seventh Ave., Seattle, Wash., archts. CD 11/26.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† **ALASKA**—Alaska Road Comn., Dpt. Interior, Juneau, **Morrison-Knudsen Co., Inc.,** 319 Broadway, Boise, Idaho. CA $2,543,757, grading, drainage 12 bridges on 41-mi. Richardson Hy. Sect. D. Bids July 22. CD 7/29, under LB.

▲† **Morrison-Knudsen Co., Inc.,** 319 Broadway, Boise, Idaho, CA $4,525,823, est. $4,968,796. Hardstands, taxiways and hydrant refueling facilities, Inv. 53-75, Eielson Air Force Base, ALASKA. U. S. Eng., Anchorage, Alaska. Bids July 21, awarded Aug. 12. CD 7/28, under LB.

† **United Contractors,** Fairbanks, Alaska. LB $738,382. concrete utilidors with steam, return, water and sanitary sewer lines to serve Butler bldgs., Eielson Air Force Base, Inv. 54-19, ALASKA. U. S. Eng., Anchorage, Alaska. Bids Aug. 11. CD 7/30.

▲† **S. Birch & Sons and Lytle & Green,** Securities Bldg., Seattle 1, Wash., LB $7,230,323, est. $8,495,587. Hardstands, taxiways and hydrant refueling facilities, Inv. 53-86, Elmendorf Air Force Base, ALASKA. U. S. Eng., Anchorage, Alaska. Bids Aug. 12.

Proposed Projects

WATER SUPPLY

N. H., Rochester—City, P. Wks. Dpt., City Hall, water sys. expansion, $500,000. Hayden, Harding & Buchanan, 810 Park Square Bldg., Boston, Mass., consult. engrs. CD 1/10/45.

▲ **Okla., McAlester**—City, defeated $1,000,000. bonds upon a technicately of voting, water works. W. R. Holway, 302 E. 18 St., Tulsa, consult. engr. CD 7/21.

SEWERS, WASTE DISPOSAL

Ark., Mena—City, voted bonds, sanitary sewers and WW imprvs. $769,000.

▲ **Ill., Chicago**—City, City Hall, auxiliary sewers Roscoe St. from Drake to Lowell Sts.; Lawndale Ave. from Roscoe Ave. to Addison St., Keeler Ave. from Roscoe to Belmont Aves.; Lowell Ave. from Roscoe Ave. to W. Addison St. $1,000,000. CD 2/8/51.

▲ **Ind., Lawrence**—Village, Village Hall, sewers, sewage disposal plant, exten. water mains. $1,297,000.

▲ **Md., Baltimore**—City, Bureau Bldg. Constr., 410 Municipal Bldg., Zone 2, Incinerator No. 4 Phase 2, mechanical equip. $2,300,000. Whitman, Requardt & Assoc., 1304 St. Paul St., consult. engrs. R.E.L. Williams, c/o owner, constr. engr. CD 11/17/50.

N. Y., Clay—Town, sanitary sewerage sys., $754,000.

▲ **N. Y., Geddes**—Town, sanitary sewers in North Geddes Sewer Dist., $1,020,650; sanitary sewers in South Geddes Sewer Dist., $1,281,100.

▲ **O., Ashtabula**—City, City Hall, $1,500,000. bond election Nov. 3, sewage disposal plant. Bids 3/20 rejected. CD 3/5.

Tenn., Greeneville—City, sanitary sewer imprvs. $600,000.

▲ **Tex., San Antonio**—City, City Hall, Military Plaza, bond election Aug. 18 cancelled, main sanitary sewer line, laterals, Alazan-Kampmann Sts., $1,585,323; pressure sewer main Brook Air Force Base area, $100,000; sanitary sewer line lift station, between Military Dr. and Kampmann, $200,000; general street drainage, $100,000. New date soon. CD 7/23.

BRIDGES

▲ **LOUISIANA**—Mississippi River Bridge Auth., State Hy. Dpt., Baton Rouge,
3,000 lin. ft. high level fixed hy. bridge on 4 concrete piers over Mississippi River from Erato Street Wharf, New Orleans to Lamarque St., Algiers. $57,000,000. Modjeski & Masters, State Street Bldg., Harrisburg, Pa., consult engrs. CD 6/9.

STREETS AND ROADS

Idaho, Murphy—Owyhee Co., Murphy, voted $500,000 bonds, constr., oiling 81.2 mi. between Marsing and Indian Cove.

▲ **MASSACHUSETTS**—Commonwealth of Mass., Metropolitan Dist. Comn., 20 Somerset St., Boston,
Cambridge—constr. elevated connecting road on Gaffney St. between Soldiers Field Rd. and Commonwealth Ave., $3,000,000.
wid'n. Soldiers Field Rd., $1,750,000.
Everett—build double barreled section of Revere Beach Parkway, $2,200,000.

Medford—reconstr. Charles St. on Fellsway West, $100,000.
build double-barreled hy. to replace single Fellsway-west on Forest and Main Sts., $100,000.
link in Mystic River Parkway near Forest St., $200,000.
Watertown—constr. double barreled road and traffic circle from Eliot St. Bridge to Arsenal St., $200,000.
▲ **MASSACHUSETTS**—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston,
Chicopee—hy. work, Dale St., $70,000.
Dennis—Mid Cape Hy., Rte. 134, $1,600,000.
Milton—Sect. No. 1 South East Expressway parallel to Granite Ave. and Willard St., $3,000,000.
▲ **MASSACHUSETTS**—Dpt. P. Wks., 100 Nashua St., Boston,
Worcester—Lincoln Square Proj. traffic circle, $7,000,000.
▲ **OHIO**—Ohio Turnpike Comn., 139 E. Gay St., Columbus, Zone 15,
will make engineering, traffic and other studies for 300 mi. North-South Toll Rd., between Cincinnati and Conneaut, $400,000,000. CD 4/26/51.
S. C. York—Comrs., York Co., York, road imprvs. $750,000.
▲ **Tex. San Antonio**—City, City Hall, Military Plaza, bond election Aug. 18 cancelled, permanent type paving downtown area, $7?0,000; residential street paving, throughout city, $2,500,000. New date soon. CD 7/21.

EARTHWORK, WATERWAYS

▲ † **Kansas**—Bureau Reclamation, Dpt. Interior, Indianola, Neb., Bostwick Irrigation Proj. on Republican River, near Concordia, Republic, Jewell and Cloud Counties, $4,183,571. Appropriated 1953-54. CD 9/12/44.
▲† **Oregon-Washington**—U. S. Eng., Pittock Block, Portland, Ore., hopper dredging at entrance to Columbia River, $350,650; hopper and pipe line dredging on lower Columbia River, to Longview, Vancouver and Portland, $335,000; deepening 35 shoaled areas in Columbia River, $997,100.
† **Texas**—U. S. Eng., 100 W. Vickery St., Fort Worth, work on Belton Dam (Little River and Brazos tributary) near Belton, $800,000.
† **Texas**—U. S. Eng., 100 W. Vickery St., Fort Worth, Fort Worth Floodway work on Trinity River, Fort Worth, $950,000. CD 6/9/44.
▲† **Texas**—U. S. Eng., 100 W. Vickery St., Fort Worth, Garza-Little Elm Dam on Trinity River Tributary, $3,250,000. CD 6/9/44 and 12/2/44.
▲† **Texas**—U. S. Eng., Box 61, Tulsa 2, Okla., Texarkana Dam, Texarkana, $5,000,000. CD 7/25/51.
▲ **Tex., San Antonio**—City, City Hall, Military Plaza, bond election Aug. 18 cancelled, flood control work, San Antonio River and tributaries and creeks, $1,000,000. New date soon. CD 7/21.
▲† **Washington**—U. S. Eng., 4735 E. Marginal Way, Seattle, 4, Wash., dredging Industrial Waterway, Tacoma, $800,000; hopper dredging in Grays Harbor, $195,000; inner channel pipe line dredging in Grays Harbor, $70,000; hopper dredging in Willapa Harbor, $210,000.

AIRPORTS

▲† **Va., Norfolk**—ENGINE TEST CELLS—P. Wks. Office, Fifth Naval Dist., U. S. Naval Base, Norfolk, jet engine test cells Naval Air Station. $1,850,000.
▲† **Va., Oceana**—AIRFIELD IMPRVS.—P. Wks. Office, Fifth Naval Dist., U. S. Naval Base, Norfolk, airfield paving, aircraft maintenance, storage, communication and airfield lighting facilities, U. S. Naval Air Station, $3,927,000.

LATIN AMERICA

Mexico, Matamoros—AIRPORT—Mexican Fed. Govt., Civil Air Bureau, Mexico City, plans airport, $800,000. CD 1/16/48.

PUBLIC BUILDINGS

▲ **Calif., San Lorenzo**—SCHOOL—Hayward Union High School District, 22300 Foothill Blvd., Hayward, plans by Anderson & Simonds, 2800 Park Blvd., Oakland, Village High School, $1,700,000. CD 4/11/52.
▲ **Conn., Greenwich**—SCHOOL—Town Bd. Educ., Havemeyer Bldg., plans by J. Gordon Carr, 80 W. 40 St., New York, N. Y. 2 story, brick, concrete, steel Riverside Junior High School, Lockwood Rd. $1,250,000. CD 3/24.
Conn., Litchfield—SCHOOL—Regional School District 6, c/o Roger Lyman, chn., Goshen, plans by Nichols & Butterfield, 998 Farmington Ave., West Hartford, Junior-Senior High School, Barnum Hill Site off Litchfield Bantam Hy. $850,000.
Conn., Old Saybrook—SCHOOL—Town, Thomas Curran, chn. School Bldg. Comn., Old Saybrook, plans by Warren H. Ashley, 967 Farmington Ave., West Hartford, Junior-Senior High School, $500,000. Marchant & Minges, 967 Farmington Ave., West Hartford, consult. engrs. CD 10/22/47.
▲ **Conn., Southington**—SCHOOL—Town, Bldg. Comn., Town Hall, plans by Carl J. Malmfeldt & Assoc., 36 Pearl St., Hartford, Elementary School, Recreation Park, $300,000; school, Hatton site, Spring St. $500,000; Milldale School addn., $300,000. CD 4/17.

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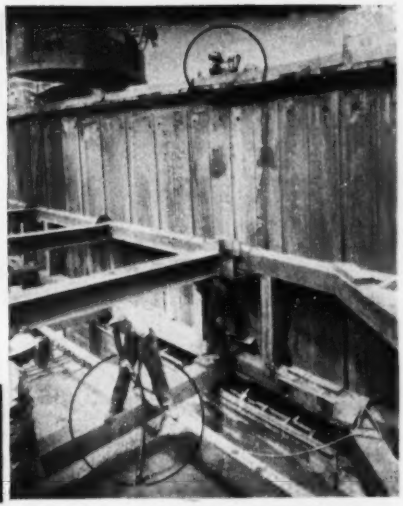

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▲ **Conn., Stamford**—SCHOOLS—City Bd. Educ., 151 Broad St., plans by William J. Provoost, 421 Main St., Junior High School, **$1,000,000**; plans by Norman L. Raymond, 18 Broad St., and Frank S. Massari, 115 Sea Side Ave., Katherine T. Murphy School, **$553,500**.

Conn., Wallingford—SCHOOL—Town, Archie Prisk, chn. Parker Farms Elementary School Bldg. Comn., Wallingford, plans by Carl J. Malmfeldt & Assoc., 36 Pearl St., Hartford, Parker Farms Elementary School. **$500,000**. CD 4/29.

▲ **Del., Wilmington**—SCHOOL—Millside School Bldg. Comn., 590 School Hill Lane, Millside, Wilmington, Millside Elementary School, **$1,500,000**.

Del., Wilmington—SCHOOL—Rosehill-Minquadale School District, Rosehill, Wilmington, elementary school. **$700,000**.

▲ **Fla., Miami Beach**—CITY HALL—City, City Hall, plans by Robert Law Weed & Assocs., 550 Brickell Ave., Miami, city hall. **$4,000,000**.

▲ **Ga., Augusta**—OFFICE—City and Richmond Co., City Hall, plans by Scroggs & Ewing, 1331 Greene St., and Kuhlke & Wade, Campbell Bldg., city and county office bldg. **$1,000,000**. CD 10/26/51.

Ind., Greentown—SCHOOL—Eastern School Corp., R. B. Miller, trus., Greentown, plans by Lennox & Matthews, 644 E. Maple Rd. Blvd., Indianapolis, Zone 5, Consolidated Twp. School, **$700,000**.

▲ **Ia., Waterloo**—SCHOOLS—Bd. Educ., Waterloo, voted **$3,000,000** bonds, high school and 2 elementary schools, 4 school addns.

Me., Orono—DORMITORY—University of Maine, Henry L. Doten, bus. mgr., Admin. Bldg., plans by Alonzo J. Harriman Inc., 292 Court St., Auburn, 4 story, 50x140x80 ft., L-shaped men's dormitory, **$800,000**. CD 12/24.

▲ **Md., Baltimore**—SCHOOL—City, Bureau Bldg. Constr., 410 Municipal Bldg., Zone 2, plans by Burton & Hopkins, 10 E. Mulberry St., 3 story, 132x128 ft., Southern Junior Senior High School No. 70 addn., alterations, incl. swimming pool bldg. **$3,500,000**, Jas. Posey & Assoc., 10 E. Pleasant St., mech. engrs. Van Rensselaer Saxe, 1701 St. Paul St., struct. engr. R. E. L. Williams, 410 Municipal Bldg., bldg. constr. engr. CD 10/15/37.

Md., Frederick—HOUSING—Frederick Housing Auth., Sixth and Bentz Sts., plans by Chas. T. Bowers, 2300 E. Patrick St., 310x390 ft. housing, 2 story, 30x32 ft. office, 2.5 acres plot area, **$800,000**, Rummel, Klepper, Kahl, 1021 N. Calvert St., Baltimore, struct. engrs., Jas. Posey & Assoc., 10 E. Pleasant St., Baltimore, mech. engrs. CD 9/27/50.

Mass., Ipswich—SCHOOL—Town, School Dpt., Robt. F. Savitt, supt. School Bldg., 23 Green St., plans by Shepley, Bulfinch, Richardson & Abbott, 1 Court St., Boston, high school, **$660,000**. CD 5/8/52.

Mass., Leicester—SCHOOL—Town, School Bldg. Comn., c/o Supt. Schools, plans by L. W. Briggs, 90 Park Ave., Worcester, upper elementary school, Pleasant St. $530,000. CD 2/5/52.

Mass., Sharon—SCHOOL—Town, Bldg. Comn., Wilfred A. Howe, chn., elementary school, **$650,000**.

▲ **Mich., Detroit**—GARAGES—City, Municipal Parking Auth., 1214 Griswold St., rein.-con., parking garage First and Abbott Sts., **$1,500,000**; concrete parking garage, First and Bagley Sts., **$1,500,000**, George R. Thompson, Guardian Bldg., city engr.

▲ **Mich., Lansing**—POLICE STATION-JAIL—City, R. W. Crego, mayor, plans by Lee & Kenneth C. Black, 706 Savings & Loan Bldg., brick, steel, concrete municipal bldg. to incl. police station and jail, **$2,300,000**. CD 1/19/53.

▲† **N. Y., Niagara Falls**—PLANT—U. S. Atomic Energy Comn., 70 Columbus Ave., New York, Zone 23, facilities for classified production at Lake Ontario Ordnance Works, Over **$5,000,000**. Singmaster & Breyer, 420 Lexington Ave., New York, engrs. and archts. Hooker Electrochemical Co., Niagara Falls, operates plant.

▲ **N. C., Goldsboro**—SCHOOL IMPRVS.—Wayne County Bd. Educ., Goldsboro, voted bonds, school imprvs. **$2,336,000**. CD 6/18.

N. C., Raleigh—SCHOOL—Wake Co. Bd. Educ., Court House, plans by Frank B. Simpson, 2607 Vanderbilt Ave., high school, Fuquay Springs, **$500,000**. CD 3/2.

▲ **O., Columbus**—HOUSING—Columbus Housing Auth., 425 W. Rich St., voters rejected proposal to construct 524 unit Woodward Avenue Public Housing. **$6,500,000**. CD 1/6.

▲ **O., Coshocton**—HOSPITAL—Comrs. Coshocton Co., Coshocton, **$1,600,000**. bond election Nov. 3, memorial hospital.

O., Mount Vernon—HIGH SCHOOL—Kokosing Valley School District, Mt. Vernon, **$685,000** bond election Nov. 3, high school and renovating 4 grade schools. CD 9/4.

▲ **O., Napoleon**—SCHOOLS—Bd. Educ., voted bonds, school to be known as Central Bldg., on present high school grounds, **$770,000**; school on south side, **$330,000**.

▲ **O., Wapakoneta**—SCHOOLS—Wapakoneta School Bd., bond election Nov. 3, high school, elementary school addns., and repairing present high school **$1,195,000**.

Pa., Willow Grove—SCHOOL—Upper Moreland Twp. School District, Willow Grove, plans by Heacock & Platt, Schaff Bldg., Phila., elementary school, Township Line, **$750,000**. CD 1/9.

Tex., Hempstead—COURT HOUSE—Waller Co., Hempstead, voted **$625,000** bonds Aug. 8, 3 story, 63x128 ft. court house, 2 story jail, brick, masonry, Herbert Voelcker & Assoc., 1202 Dennis St., Houston, archts. CD 7/22.

Tenn., LaFollette—HOSPITAL—City and Campbell Co., plans by Bianculli & Palm, Volunteer Bldg., Chattanooga, hospital. $600,000.

Tex., San Antonio—HEALTH CENTER—City, City Hall, Military Plaza, bond election Aug. 18 cancelled main public health center, Live Oak St. $900,000. New date soon. CD 7/21.

▲ **Wash., Olympia**—SCHOOL—School Bd., Olympia, high school, $1,500,000. CD 11/16/50.

Alaska, Anchorage—CITY HALL—City, City Hall, $800,000 bond election Sept. 1, city hall. CD 8/3/45.

COMMERCIAL BUILDINGS

Ala., Birmingham—APARTMENT UNITS—Valley View Apartments, 1779 Valley Ave., plans by Allen Bartlett, 1779 Valley Ave., 96 apartment units. $500,000.

Calif., Garden Grove—DWELLINGS—W. K. Murphy, c/o Orange County Drafting Service, archt., 810 Coast Blvd., Newport Beach, 80 frame, stucco dwellings. $500,000.

▲ **Calif., Oakland**—HOTEL—Ben Swig, Fairmont Hotel, San Francisco, 400-500 room hotel $8,000,000. Negotiating with City of Oakland for lease of city property fronting Lake Merritt.

▲ **Calif., San Francisco**—OFFICE—Pacific Mutual Life Insurance Co., 660 Market St., San Francisco, plans by W. D. Peugh, 333 Montgomery St., office, Kearny and California Sts. $1,500,000.

▲ **Calif., Van Nuys**—DWELLINGS—Salcrest & Assocs. 241 S. Robertson Blvd., Beverly Hills, 180 dwellings $1,700,000.

▲ **D. C., Wash.**—NURSING—Georgetown University Medical Center, 35 and Prospect Ave. N.W., plans by Leon Chatelain, 1727 K St. N.W., 4 story, brick, limestone nursing bldg., 35 and Prospect Ave. N.W. $1,350,000.

Fla., Miami—MOTOR COURT—Sunny Isles Motor Court, c/o Leonard H. Glasser, 835 Lincoln Rd., Miami Beach, motor court, $750,000.

▲ **Ill., Morton Grove**—HOSPITAL—Niles Twp. Community Hospital, 1789 Old Briar Rd., Highland Park, plans by Barancik & Conte, 919 Michigan Ave., Chicago, Zone 11, hospital, $2,000,000.

Ind., East Chicago—SCHOOL, etc.—Assumption Church, 4001 1 St., plans by J. E. Potter & Assocs., Schofield Bldg., Cleveland, O., school and recreation center, $500,000.

▲ **La., New Orleans**—APARTMENT—Knights of St. Peter Claver, 1821 Orleans Ave., plans by Goldstein, Parham & Labouisse, American Bank Bldg., apartment for negroes, $1,750,000.

Md., Baltimore—HOUSES—Ballard Contractors, Inc., 210 E. Lexington St., plans by Hal A. Miller, 2118 Maryland Ave., fifty-two 2 story, bsmnt., 16x32 ft., brick, block houses, $800,000.

Md., Towson—CHURCH—Towson Methodist Church, 622 York Rd., plans by J. Alfred Hamme, 123 E. Phila. St., York, Pa., church, Hampden Lane near Dulaney Valley Rd. $550,000.

Mass., Millbury—CHURCH—St. Bridgets R. C. Church, Very Rev. Mgr. Griffin, Chancery Office, 52 High St., Worcester, plans by Curtin & Riley, 45 Newbury St., Boston, church, Elm St. $700,000-$800,000.

▲ **Mass., Norwood**—OFFICE—Factory Mutual Fire Insurance Co., 184 High St., Boston, plans by Cram & Ferguson, 248 Boylston St., Boston, home office, $2,500,000.

▲ **Mo., Kansas City**—MOTEL—Arrowhead Ranch Motel, c/o C. P. Davis, c/o Roger Frangkiser & Assoc., archts., 803½ W. 39 St., Kansas City, Mo., 136 motel unit, 18 separate bldgs., restaurant, swimming pool, 15 acre site, US 40 and Noland Rd. near here $1,300,000.

Nev., Reno—OFFICE—Bell Telephone Co. of Nevada, 210 W. 2 St., central office addn. $500,000.

▲ **N. Y., Buffalo**—BANK—The Federal Reserve Bank of New York, 33 Liberty St., New York, 4 story branch bank, $3,000,000.

O., Warren—STORE—S. S. Kresge Co., 120 E. 41 St., New York, N. Y., store addn., W. Market St. $500,000.

▲ **Pa., Jenkintown** — STORE, etc. — Strawbridge & Clothier, 8 and Market Sts., Phila., plans by Herbert B. Beidler, 952 N. Michigan Ave., Chicago, Ill., department store addns., alterations, $1,000,000 CD 5/16/52.

▲ **Pa., Pittsburgh**—OFFICE—Tchirkow & Rumekamp, 3900 Washington Pl., plans by Arthur Tennyson, 666 Washington Rd., 6 story bsmnt. 50x250 ft., masonry office, Mt. Lebanon, $1,000,000.

▲ **Tenn., Memphis**—APARTMENT—Geo. Harsh, Jr., Commerce Title Bldg., apartment, $5,000,000.

▲ **Tex., Houston**—DWELLINGS—Bayou Cities Properties, Inc., 1602 Old Spanish Trail, 18 dwellings, $325,000; 30 dwellings, $550,000; 15 dwellings, $300,000; 23 dwellings, $445,000; 12 dwellings, $325,000; 10 dwellings, $345,000, off Broadway.

▲ **Tex., Houston**—SCIENCE and CLASSROOM WINGS, etc.—University of St. Thomas, 3812 Montrose Blvd., science and classroom wings, $300,000; students' union bldg., $500,000; chapel, $400,000. CD 7/13/51.

▲ **Va., Richmond**—APARTMENT—Carlton House, Inc., represented by Milton Glaser, 6907 Park Ave., 8 story, 125-unit apartment development, $2,000,000.

INDUSTRIAL BUILDINGS

▲ **Calif., Alameda**—WAREHOUSE, etc.—Western Electric Co., 1400 53 St., Emeryville, plans by Thomsen & Wilson, 315 Montgomery St., San Francisco, warehouse, shop and office, Williams St. and Doolittle Dr., Eden Twp. $3,000,000. Western Electric Co., 195 Broadway, New York, N. Y., staff engr.

▲ **Calif., El Segundo**—REFORMERS—Standard Oil Co., 225 Bush Ts., San Francisco, large catalytic reformers for upgrading of gasoline, $15,000,000.

Calif., Fontana—SOAKING PITS, etc.—Kaiser Steel Corp., Fontana, 2 soaking pits, pipe mill addns., and ingot mold foundry, $800,000.

▲ **Calif., Richmond**—REFORMERS—Standard Oil Co., 225 Bush St., San Francisco, large catalytic reformers for upgrading of gasoline, $15,000,000.

▲ **Ind., Hammond**—TRUCK TERMINAL—Standard Oil Co. of Indiana, 910 N. Michigan Ave., Chicago 5, Ill., truck terminal, 129 St. near Calumet Ave. $2,000,000.

▲ **Miss., Jackson**—PLANT—Swift & Co., Union Stockyards, Chicago, Ill., meat packing plant, $1,000,000.

▲ **N. C., Burgar**—PLANT—Volunteer Portland Cement Co., 502 Gay St. S. W., Knoxville, Tenn., plant, Over $2,000,000.

▲ **Pa., Phila.**—PLANT—Edward G. Budd Mfg. Co., 2450 Hunting Park Ave., plans by Giffels & Vallet, Inc., archt.-engr., 1000 Marquette Bldg., Detroit, Mich., chassis fabrication plant addn. $9,000,000. CD 1/31/52.

Tex., Fort Worth—PLANT—Northwestern Compress Co., Cold Springs Rd., reconstr. 4 block long cotton compress plant. $500,000.

▲ **Tex., Houston**—REFINERY FACILITIES—Eastern States Petroleum Co., Inc., Ship Channel, Houston, expanding, imprv. alkylation refinery facilities for increasing production of aviation gasoline near here $2,100,000.

UNCLASSIFIED

▲ **La., New Orleans**—RACING TRACK—Magnolia Park, Inc., Hibernia Bank Bldg., plans by Herbert A. Benson & Geo. J. Riehl, National Bank of Commerce Bldg., harness racing track, $1,000,000.

▲ **Md., Baltimore**—PIER and PORT EXPANSION—Western Maryland R. R. Co., E. C. Shreve, ch. engr., Standard Oil Bldg., Zone 2, pier and port expansion facilities, Port Covington Terminal, exten. of Pier 9 to 1,150 ft. addn. of 6,000 ft. of track, west of Hanover St., addnl. tracks on Piers 8 and 9, imprv. gantry cranes, Port Covington. $4,500,000. CD 12/13/50.

† **Md., Carderock**—WIND TUNNEL—Dist. P. Wks. Office, Potomac River Naval Command, Naval Gun Factory, Wash., D.C., wind tunnel at David Taylor Model Basin $665,000.

▲ **Texas**—TRANSMISSION LINES—Lone Star Gas Co., 1915 Wood St., Dallas, 44 mi. 12 in. transmission line from north of Tyler to near Sulphur Springs in Hopkins Co., $875,000; electric sub-station, Tyler, $100,000; field gas-gathering and well lines 4 and 6 in. pipe, Red Springs north of Tyler, $90,000. CD 6/19/50.

▲ **Tex., Houston**—DOCK IMPRVS.—Port Comm., Wharf No. 13, bond election Sept. 12, Long Beach dock imprvs., $500,000; Warehouse No. 1, $1,500,000; Warehouse No. 2, $1,250,000; No. 1 wharf, $2,275,000; No. 2 wharf, $1,975,000; grain wharf, $950,000; constr. grain unloading proj., $450,000. Bond election date extended. CD 8/6.

Tex., San Antonio—FIRE ALARM SYSTEMS—City, City Hall, Military Plaza, bond election Aug. 18 cancelled central fire alarm sys. bldg. Houston and Nacogdoches Sts., $995,000; imprvs., expansion underground fire alarm cable sys., $183,560. New date soon. CD 7/21.

Tex., San Antonio—TRAFFIC SIGNAL—City, City Hall, Military Plaza, bond election Aug. 18 cancelled, downtown traffic signal sys. modernization, extens., underground cable. $500,000. New date soon. CD 7/21.

† **Va., Portsmouth**—CRANE TRACKS—P. Wks. Office, Fifth Naval Dist., U.S. Naval Base, Norfolk, crane tracks at dry dock, $975,000.

▲† **Washington**—TRANSMISSION LINES, etc.—Bonneville Power Admin., P. O. Box 3537, Portland, Ore., Grand Coulee-Snohomish transmission line No. 2, $139,000.
Chief Joseph-Snohomish Transmission Lines Nos. 3 and 4, $9,078,000, CD 4/4/52.
McNary-Walla Walla transmission line, $448,000.
Midway-Moxee, $512,000.
Spokane area service, $883,000.
Upper Olympic Peninsula Service, $150,000.
Shelton-Kisap-Bremerton Transmission Line No. 2, $401,000.
Chehalis Sub-station addns., $93,000.
Wenatchee aluminum plant service, $67,000.
North Bonneville Sub-station addns., $127,000.
Clark County service, $83,000.
Services to Carborundum Co. at Vancouver, $104,000.
Longview area service, $158,000.
Midway sub-station addn. $270,000.
Benton County service, $156,000.
Franklin County service, $255,000.
Albani Falls loop $124,000.

▲ **Ont., Hamilton**—WHARF, etc.—International Harvester of Canada Ltd., Sherman Ave. N., wharf and dock expansion. $1,000,000.

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Bids—Low Bids—Contracts—Second Section

NEW ENGLAND

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
STREETS AND ROADS
September 1 Massachusetts

BUILDINGS

LOW BIDS AND CONTRACTS

J. W. Bishop Co., 109 Foster St., Worcester, Mass. CA Est. $900,000. BANK addn., alterations, 440-442 Main St., WORCESTER, MASS. Worcester County Trust Co., 400 Main St., Worcester, Mass. Bids July 29. CD 7/15.

MIDDLE ATLANTIC

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
September 8 New Jersey
STREETS AND ROADS
September 3, 8 New Jersey

▲† **N. J., Wrightstown**—FUEL STORAGE FACILITIES—B.A. 9/8—U. S. Eng., 121 N. Broad St., Phila., Pa., fuel storage facilities, McGuire Air Force Base, $3,000,000. John L. Kistner, 4 S. 25 St., Phila., Pa., archt. and engr. CD 6/14, under LB.

▲ **Md., Salisbury**—B.A. 9/18—City, sewers, pumping stations, water mains, primary treatment plant, secondary treatment units, $1,000,000. Gardner & Sterling, Salisbury, engrs. CD 6/21/48.

▲† **Del., Dover**—FACILITIES—B.A. After 9/24—U.S. Eng., 121 N. Broad St., Phila., Pa., avgas and lube oil facilities, Dover Air Force Base, ENG-36-109-53-366, $1,460,424. Jaros Baum Bolles, Penna. R.R. Bldg., Wilmington, engrs. Bids Feb. 10 rejected. CD 2/19, under LB.

BIDS ASKED—BUILDINGS

▲ **N. J., Newark**—SCHOOL, etc.—B.A. 9/1—Bd. Educ., Bd. of Education Bldg., East Side High School addn., alterations, $1,500,000. CD 5/26/50.

▲ **N. J., Newark**—HOSPITAL—B.A. About 9/3—City, City Hall, 17 story, approx. 55x289 ft., hospital. $10,000,000 (incl. equip.) Ziegler, Childs & Paulsen, 921 Bergen Ave., Jersey City, archts. Bids Apr. 7 cancelled. CD 4/1.

▲ **N. Y., Oceanside**—HOSPITAL—B.A. 9/29—South Nassau Communities Hospital, 35 Oceanside Rd., hospital addn., Oceanside Rd., $2,300,000.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **NEW YORK**—Bureau Contract & Accounts, The Governor Alfred E. Smith State Office Bldg., Albany, **Rusciano & Son Corp.,** 728 E. 212 St., New York, N. Y., CA, $3,884,498, 0.88 mi. Thy., 1.48 mi. Acc. New York State Thruway-Hudson Sect. Sub 9A, Tappan Zee Bridge, Tarrytown, App SH 9206 Broadway-Hastings, Dobbs Ferry-Mt. Pleasant-Tarrytown, N. Tarrytown, Van Wort Ave. Sheldon Ave., H.T. 53-5, S.T. 53-25, R.C. 53-88, Westchester Co. Bids July 9. CD 7/15, under LB.

▲ **Arundel Corp.,** Pier 2, Baltimore, Md. CA $11,590,000. Phase 1 and 2 Ashburton Filtration Plant, BALTIMORE, MD. City, Bureau Water Supply, 503 Municipal Bldg., Baltimore 2, Md. CD 8/13, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **B. J. Lucarelli & Co.,** 22 Orchard St., Jersey City, N. J. CA $1,858,000. East Poplar Low Rental HOUSING PHILA., PA. Phila. Housing Auth., 42 S. 15 St., Phila., Pa. Bids June 9. CD 5/27.

▲ **John McShain, Inc.,** 2 W. Franklin St., Baltimore, Md. LB $1,300,000. DORMITORY and ALUMNI MEMORIAL HALL alterations, BALTIMORE, MD. John Hopkins University, 32 and Charles Sts., Baltimore, Md. Bids Aug. 11. CD 7/28.

▲† **Joseph Nebel Co.,** 2140 P St. N.W., Wash., D. C. LB $1,058,000. water tunnel bldg., electric SUBSTATION, etc., David Taylor Model Basin, NOY 73362, CARDEROCK, MD. Dist. P. Wks. Office, Potomac River Naval Command, Naval Gun Factory, Wash., D. C. Bids Aug. 12. CD 6/29.

SOUTH

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
September 10 Florida
STREETS AND ROADS
September 10 Florida

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Thompson & Street Co.,** Pineville Rd., Charlotte, N. C., LB, $8,653,800, combined bid on 2 state OFFICES, ATLANTA, GA. State, State Capitol, Atlanta, Ga. Bids Aug. 19. C.D. 6/23.

MIDDLE WEST

BIDS ASKED—HEAVY CONSTRUCTION

▲ **Ind., Muncie**—B.A. 10/1—Bd. P. Wks., City Hall, sewage treatment plant and 17,134 ft. interceptor sewers, $4,000,000. Extended date. Havens & Emerson, Leader Bldg., Cleveland, O., consult. engrs. CD 7/21.

BIDS ASKED—BUILDINGS

▲ **Ill., Chicago**—DORMITORY—B.A. 9/11—City, City Hall (1) youth detention dormitory and (2) men's detention dormitory, $2,000,000. CD 12/14/51.

▲ **Mich., Ann Arbor**—COUNTY—B.A. 9/15—Bd. Supervs. Washtenaw County, County Bldg., 3 story, brick, steel, concrete county bldg., Main, Huron, Fourth and Ann Sts. $2,500,000. Plans deposit $25, refundable, R. S. Gerganoff, 206 N. Washington St., Ypsilanti, archt. CD 5/20/52.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **OHIO**—Ohio Turnpike Comm., 139 E. Gay St., Columbus, Zone 15,
Lombardo Bros. Constr. Co., 3600 Ridge St., Cleveland, O. LB $3,625,160, Contr. C-24, bridges, culverts, etc., Lorain Co.;
Badgett Mine Stripping Corp., Madisonville, Ky. LB $4,363,170. Contr. C-25, bridges, culverts, etc. Lorain Co.; LB $8,003,265, Contr. C-24 and 25, bridges, culverts, etc., Lorain Co.;
A. J. Baltes, Inc., Norwalk, O. LB $3,343,402, Contr. C-26, bridges, culverts, etc. Lorain Co.; LB $3,273,680, Contr. C-27, bridges, culverts, etc. Erie Co.; LB $6,589,497, Contrs. C-26 and 27, bridges, culverts, etc. Lorain and Erie Counties;
Ralph Myers Contg. Corp., Salem, Ind., LB $7,403,328. Contrs. C-25 and 26, bridges, culverts, etc., Lorain Co. Bids Aug. 12. CD 7/15.

▲ **Schirmer-Peterson Co.,** 6830 Beaver Ave., Cleveland, O. LB $1,908,000, est. $2,200,000. maintenance bldg., passenger station, bus roadways, at Windermere Terminal of Cleveland Rapid Transit System, East Cleveland, CLEVELAND, O. Cleveland Transit System, 1404 E. 9 St., Cleveland 14, O. Bids Aug. 14. CD 7/10.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Muller Constr. Co., Inc.,** 911 Commerce Bldg., Rochester, N. Y. CA Est. $5,000,000. SHOPPING CENTER, Incl. 33 stores, Werk Rd. and Glenway Ave., CINCINNATI, O. Brune-Harpenau Builders, Inc., 3073 Nelsel Ave., Cincinnati, O. Joseph Allen, 4638 Glenway Ave., Cincinnati, O., engr. Awarded Aug. 13. CD 3/19.

▲ **Woodland Constr. Co.,** 2601 Peterson Rd., Chicago, Ill., Owner Builds, $2,000,000. 200 HOMES, GRAYSLAKE, ILL.

▲ **White Realty-Pottawatomie Hills, Inc.,** 188 W. Randolph St., Chicago 1, Ill., Owner Builds, $1,300,000. 100 HOMES in Pottawatomie Hills area near HAZELCREST, ILL.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
September 3 Kansas September 4 Minnesota
STREETS AND ROADS
September 3, 4 Kansas September 4 Minnesota

BIDS ASKED—BUILDINGS

▲ **Tex., Fort Worth**—STUDENT CENTER—B.A. 9/22—Texas Christian University, c/o Dr. M. E. Sadler, pres., Fort Worth, 2 story, 110x240 ft., rein.-con., brick stone student center on campus, $1,000,000. Plans deposit $25. Preston M. Geren, 1607 Fort Worth National Bldg., archt. CD 2/12.

SOON LETS CONTRACT—HEAVY CONSTRUCTION

▲ **Montana, Idaho and Washington**—OIL PIPE LINE—Continental Pipe Line Co., subsidiary of Continental Oil Co., Ponca City, Okla., soon lets contract. 540 mi. 10 in. oil pipe line from Billings Mont. to Spokane, Wash. $16,000,000-$20,000,000. CD 11/7.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **IOWA**—State Hy. Comn., Ames,
Quad City Constr. Co., 644 25 Ave., Rock Island, Ill., CA, $619,315, paving 11.622 mi. Special FN-352, Henry and Louisa Counties;
Fred Carlson Co., Decorah, Ia., CA, $1,009,809 paving 15.439 mi. F-887 (2), Linn Co. Bids Aug. 11, awarded Aug. 15. CD 8/14, under LB.

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▲† Lytle & Green, P. O. Box 206, Sioux City, Ia. CA $5,143,152. earthwork, Stage III, Oaha Reservoir Proj., Pierre, Inv. 25-066-53-284, SOUTH DAKOTA. U. S. Eng., 1709 Jackson St., Omaha, Neb. CD 8/12, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ J. E. Dunn Constr. Co., 929 Holmes St., Kansas City, Mo. CA $1,829,785, general contract;
U. S. Engineering Co., 914 Campbell St., Kansas City, Mo. CA $508,780. heating, plumbing for secondary SCHOOL, Arlington and Truman Rds., KANSAS CITY, MO. Bd. Educ., Library Bldg., Kansas City, Mo. CD 8/12, under LB.

▲ Geo. W. Miller, Victor Bldg., Kansas City, Mo. Owner Builds. $1,000,000. 49 DUPLEXES and SHOPPING CENTER, KANSAS CITY, MO.

▲ Carmichael & James Constr. Co., Hastings, Neb. CA $1,509,400. general contract Senior High SCHOOL, HASTINGS, NEB. Bd. Educ., Hastings, Neb. CD 8/12, under LB.

▲ Texas Engineering Constr. Co., Jones Bldg., Corpus Christi, Tex. CA $1,225,000. REFINERY unit, CORPUS CHRISTI, TEX. Corpus Christi Refinery-Terminal Fire Co., 4550 Tribble Lane, Corpus Christi, Tex.

▲ Procon, Inc., 75 E. Jackson St., Chicago, Ill. CA, Approx. $7,800,000. 16,000 bbl. cap. PLATFORMER UNIT adjacent to existing refinery, near SWEENY, TEX. Phillips Petroleum Co., City National Bank Bldg., Houston, Tex. CD 8/18.

FAR WEST

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
September 9 California

STREETS AND ROADS
September 9, 10 California

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† Guy F. Atkinson Co., 10 West Orange Dr., South San Francisco, Calif., LB, $7,162,800, est. $7,500,000. Cherry Valley Dam, Cherry River Proj. HHWC 259, SAN FRANCISCO, CALIF. Public Utilities Comn., City Hall, San Francisco, Calif. Bids Aug. 18. CD 7/29.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ Carson Park Builders, Box 8086, Long Beach, Calif., CA, $1,204,000, 172 dwellings, on Raven Ave., Studebaker Rd., Volk Ave., etc. CARSON PARK, CALIF. Carson Park Mutual Homes, Box 8086, Long Beach, Calif. Paul J. Duncan, 13310 Moorpark St., Sherman Oaks, Calif. archt.

CANADA

BIDS ASKED—BUILDINGS

▲ Que., Quebec City—HOSPITAL—B.A. 9/2—Bd. Governors Jeffrey Hale Hospital, 4 St. Cyrille St., hospital, St. Sacrement and Ste. Foye Rd. $2,850,000. L. Mainguy, 1045 Chaumont Ave., Sillery, archt. Bids 8/3 not accepted. CD 7/14.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ Cassair Asbestos Corp., 675 West Hastings St., Vancouver, B. C. Owner Builds, $4,500,000. asbestos project incl. plant, townsite, school, hosptial, churches, etc. McDames Creek Area, VANCOUVER, B. C.

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VOLUME OF PROPOSED WORK ENTERING ENR's BACKLOG
JANUARY-JULY '53

Dollar Figures in Millions

	Public	% gain or loss over '52	Private	% gain or loss over '52	Total	% gain or loss over '52
Jan.	$1,246,335	+109	$688,569	+6	$1,934,904	+56
Feb.	644,965	+42	1,013,086	+95	1,658,051	+70
Mar.	491,723	+1	1,172,821	+159	1,664,544	+77
Apr.	447,393	−2	810,423	+60	1,257,816	+30
May	339,965	−47	444,797	−53	784,762	−50
June	514,363	−23	662,727	+86	1,177,090	+15
July	483,516	−41	838,253	+40	1,321,769	−7
Total	4,168,260	+1	5,630,676	+39	9,798,936	+20

ENR's backlog keeps growing: Impetus is from private work

Proposed public work gains little; but industrial and commercial plans are booming

Nearly $9.8 billion worth of proposed heavy construction projects were reported by ENGINEERING NEWS-RECORD and the Construction Daily during the first seven months of this year. This is 20% more than dollar volume of work proposed in the similar 1952 period.

The result of this flow of new projects, minus the work which passed from backlog to contract stage and the abandoned projects removed from the backlog, leaves ENR's total backlog at $72.4 billion as of the beginning of August. This is a gain of a little more than 5% since the end of last year.

Nearly all the gain is in the field of private construction. Federal economy measures are the reason why, since April, volume of proposed public work has lagged behind the comparable 1952 month (table, above). The result is that while proposed private work has gained 39% over last year, public construction is up only 1%.

• **Encouraging**—You will see something else if you study the table. After getting off to a flying start early in the year, volume of proposed private work dropped sharply in May, compared with May, 1952. But since then proposed private projects have picked up nicely.

However, during the month of July the gain in proposed private work was not large enough to offset the drop in public work (table). The result was that the total of new projects entering the backlog dropped below the same month in 1952 for the second time this year.

There has been a pronounced gain in proposed industrial work, which totaled nearly $2.3 billion during the first seven months, and in commercial projects, which totaled almost $1.2 billion, in this industrial category, the gain was 30% above last year; for commercial projects, it was 78%.

In public work, there have been large increases in volume of proposed highways, bridges, and sewerage work. This increase has been created by state and municipal projects, not federal ones. Highways totaled nearly $1.1 billion up 65%. Bridges totaled $325 million, up 157%. Sewerage proposals were $287 million, up 22%.

The declines in proposed public work came in: (1) Buildings, down 22% from last year (2) earthwork and waterways, down 12% (3) unclassified, down 23%. Total volume in the very important building category was about $1.6 billion, compared with over $2 billion last year. The total for earthwork and waterways was $351 million so far this year, while unclassified projects totaled $423 million.

Jersey Turnpike plans $100-million extension

Now that the New Jersey Turnpike has proved itself a tremendous success, the Turnpike Authority announced last week that it is going ahead with the first major extension—an 8½-mile road link between the Holland Tunnel and the turnpike interchange at Newark Airport. The project is estimated to cost $100 million, of which about $40 million will be spent on a high-level bridge across Newark Bay. Previous financing required to build and improve the 118-mi. turnpike totaled $285 million.

Paul L. Troast, chairman of the authority, hopes that financing can be arranged within two months, and that construction will start soon after. Other estimates are that construction could not start until next spring. However, it seems likely that the extension will be ready for traffic by the summer of 1955.

More phones

To provide them, AT&T keeps building at a furious pace

It seems impossible to keep up with the tremendous demand of the American people for telephone service. In spite of the multi-billion-dollar construction program which American Telephone & Telegraph Co. and its subsidiaries have carried on since World War II, there are now about 500,000 people waiting for telephones and about 1,250,000 customers on party lines who want better service.

That's why, last week, AT&T announced the biggest single piece of financing ever planned by a corporation. It will be spent for construction of telephone facilities. If stockholders approve, Bell will issue up to $625 million of convertible debentures this fall. Terms of the issue haven't been announced.

Since the war, the company has raised about $2 billion by selling five king-sized issues of convertible debentures, and has picked up another $875 million through straight debentures. The subsidiary companies have also done plenty of financing.

It's expected that stockholders will be offered first crack at subscribing for the debentures, as with previous convertible issues. Probably, too, there will be the usual requirement that the debenture-holder put up additional cash when he converts his bonds into stock.

The announcement suggests that AT&T management does not expect long-term money to be very hard to borrow this fall.

To get more industry

States use engineer firms to attract new business

State governments are going after new industry in a big way, and that means more business for engineering firms. And when the hunt for new industries is successful, that usually means more construction.

For instance, the Oklahoma State Planning and Resources Board recently signed a $3,000 contract with the Chemical Plants Division of Blaw-Knox Co., whereby that group will make a preliminary evaluation of the state's resources, to determine what types of industry it should try to attract.

C. Langston, director of the board's industrial planning division, says that the state has never had the facts on its own resources. The Blaw-Knox survey will cover refinery gases, salt and oil-field brine, limestone, natural gas, available chemical products, soybeans, cottonseed, and other sources of vegetable oils, and coal for coke.

The study will include a critical analysis of raw materials and other local resources, and point out the products which could be produced. These specific industries will then be evaluated with respect to location and requirements of possible markets, location and extent of competition. Where there appear to be prospects for specific industries, the report will work out possible production processes, plant and manufacturing costs. This will enable the board to make concrete proposals to outside companies.

• **Many others**—Similar studies have been made or are now under way in many states. Ebasco Services, Inc., of New York, has already turned in a report on the economic resources of the upper peninsula of Michigan, paid for by business interests in the state and sponsored by the Michigan Economic Development Commission.

Vermont's State Development Commission has retained the National Farm Chemurgic Council, Inc., to survey the state's agricultural and industrial potentials.

West Virginia University's College of Commerce is surveying economic resources of that state. And a subcommittee of the Wyoming Natural Resources Board recently started the sixth of a series of local industrial surveys.

In Oregon, a State Industrial Development Commission has been organized to survey the state's industries, and attract new ones.

In several other states, development commissions are working along the same lines.

Business briefs . . .

• **Package air conditioning** (ENR July 16, p. 151) gets another boost. Westinghouse Electric Corp., will re-enter the field with a new line of small units in 1954, after having been out of this business since 1942.

• **Henry J. Kaiser Co.,** has set up an engineering firm in Canada, offering engineering design, and construction service. The new outfit is the Kaiser Engineers Division of Henry J. Kaiser Co. (Canada), Ltd., and will have its headquarters in Montreal.

• **Garden State Parkway** in New Jersey won't cost more than the $285 million originally estimated in spite of rising labor and materials costs. That's the word from Bayard England, treasurer of the New Jersey Highway Authority. He expects the entire 165-mi toll road will be open next year.

• **Chain Belt Co.,** Milwaukee, has acquired control of Crothers Engineering, Ltd., of Toronto. The Canadian firm, which now does general metal fabrication and machine work, will add some Chain Belt products to its line. This is CB's first Canadian plant.

CONSTRUCTION TRENDS

Commercial banks have financed a major share of postwar state and local public works

Probably few construction men realize how much of the tremendous postwar program of state and local public works has been financed by commercial banks. According to a study by the Federal Reserve Bank of Chicago, total outstanding municipal bonds—issued mainly to finance construction—are about double the $16-billion volume of 1946. About 34% of these bonds are now held by commercial banks. The banks have acquired about half of the net increase in municipal bonds since 1946, bidding against property insurance companies, corporations, high-income individuals, and taxable trust funds.

The major reason for the popularity of municipals is pretty obvious. Since they are exempt from federal income tax, they have grown more popular as income tax rates have risen. For corporations, the yields on municipals are comparable with after-tax yields on investment-grade common stocks. And for wealthy individuals, municipal yields are far superior to investment-grade stocks (ENR July 23, p. 78).

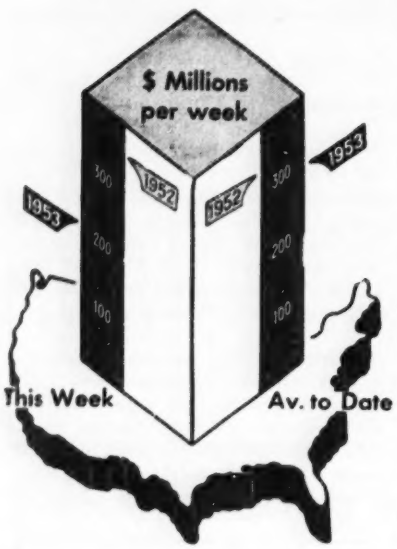
There are other reasons why banks are particularly interested in municipals. They are much easier to sell on the open market than mortgages. Their credit standing is good: During the depression there were few defaults or delays in payment. In this respect, of course, general-obligation bonds backed by the community's taxing power are superior to revenue bonds, backed only by the revenues from a specific income-producing public facility. Furthermore, banks usually invest in the securities issued by their own communities, since they are familiar with local conditions and have a sense of loyalty.

However, it's possible that municipals may not always be as popular with banks as they are now. The Chicago Federal Reserve Bank raises the question whether a continuing flood of new municipal issues, if it went on long enough, could weaken the credit standing of some states and municipalities.

There's no doubt that a tremendous volume of new bonds is on the way. Just take a look at ENGINEERING NEWS-RECORD's figures on local contract awards by local governments this year, and the backlog of proposed projects.

Construction men, particularly engineers and architects, have a responsibility in this situation, both to the communities that sell bonds and to the investors who buy them. The responsibility is this: to see that construction and design of municipal works are suited to the financial capacities of the communities that must pay for them.

Activity This Week



Amount of contracts let

	This Week	Cumulative 35 wks. 1953	1952	% chge
Federal ...	$20.7	$1,0657.2	$3,732.7	−71
State and Municipal	131.8	3,425.9	2,882.6	+19
Total pub.	152.5	4,491.1	6,615.3	−32
Total priv.	61.8	5,854.8	4,688.5	+25
U. S. Total.	**$214.3**	**$10,345.9**	**$11,303.8**	**−8**

Contracts by type of work

Waterworks	$14.9	$168.7	$155.4	+8
Sewerage ...	7.1	274.5	197.6	+39
Bridges	33.3	510.9	262.3	+95
Highways ..	21.9	1,196.2	1,054.4	+13
Earthwork, Waterways.	7.0	282.5	347.6	−19
Buildings: Public, excl. hsg.	41.1	1,167.2	3,551.9	−67
Housg., pub.	12.0	312.8	489.2	−36
Housg. priv.	22.8	2,449.7	2,042.6	+20
Commercial	14.8	840.6	411.2	+104
Industrial.	17.8	1,883.2	1,890.2	−0.3
Unclassified.	21.6	1,256.6	901.4	+40
Total	**$214.3**	**$10,345.9**	**$11,303.8**	**−8**

New capital for construction

	Week of Aug. 20 1953	Cumulative 35 Wks % 1953	1952-53 chge
Corporate securities	$52.3	$3,184.3	+26
State and municipal:			
Excluding housing	81.3	2,846.5	+31
Housing	...	212.8	+17
Federal loans	0.8	83.9	−72
Federal aid	...	762.7	+39
Total non-federal..	**$134.5**	**$7,090.2**	**+24**
Federal approp.			
In U. S.....	...	1,532.7	−77
Outside U. S.....	...	28.8	−84
Total new capital...	**$134.5**	**$8,651.7**	**−32**

ENR indexes		Base 1913	Years = 100 1926	1949
Construction cost	Aug 1953	611.87	294.13	128.27
	Jul	604.10	290.39	126.64
Building cost	Aug	437.05	236.26	124.24
	Jul	435.28	235.19	123.73
Volume cost	Jul	447	182	129
	Jun	572	233	165

UNIT PRICES

Earth dam, Alabama

Six bidders competed for a $477,807 dam contract awarded by the city of Tuscaloosa, Alabama, A. C. Parker, city engineer. The job was given to Oman Construction Co., Nashville, Tennessee, the low bidder.

The low bid was 4% below the $500,000 engineer's estimate and 30% below the high bid by Hewitt Contracting Co., Columbus, Ga. The second low bid was also below the engineer's estimates and the other four were above.

Work consists of construction of a dam, as part of the Yellow Creek Reservoir No. 2 project, which will provide water storage and gravity supply to the city-owned waterworks. It is to be 500-ft long, 91-ft high and 500-ft deep. The owner will furnish valves, piping, gates and other similar materials.

Wage rates in this area include: bricklayers, $3.00 per hr; plasterers, $2.62 per hr; carpenters, $2.24 per hr; and common laborers, $1.40 per hr.

Work began August 10 and the job is to be completed by March 1954.

Bidders include:

1C	Oman Const. Co., Nashville, Tenn	$477,807
2	A. E. Burgess Contr. Co	493,780
6	Hewitt Contr.Co. Columbus, Georgia	686,659

Bids. 7-23-53 Item	Unit	Quantity	Unit Prices 1C	2
Clear reservoir area	ac	397	$200.00	$235.00
Clear dam site	ac	3	300.00	200.00
Clear roadway	ac	4.2	100.00	200.00
Clear & grub roadway	ac	3.3	100.00	250.00
Roadway excavation uncl.	cy	38,600	0.30	0.30
rock	cy	500	1.50	1.25
Dam exc, stripping	ls	1	3,000	21,000
unclassified	cy	9,600	0.50	0.40
rock	cy	14,000	2.50	0.50
Dam borrow, clay core, exc	cy	39,300	0.40	0.48
unclassified, exc	cy	159,300	0.30	0.36
rock, exc	cy	35,000	1.25	1.15
Culvert excavation, uncl	cy	3,500	0.33	0.40
rock	cy	1,400	3.50	2.00
Cuivert approaches, uncl excavation	cy	9,000	0.33	0.30
rock excavation	cy	500	1.50	1.25
Spillway exc, uncl	cy	4,900	0.30	0.30
rock	cy	4,500	1.25	1.75
Intake tower, exc, rock	cy	170	2.00	1.25
36" water main exc, uncl	cy	50	1.00	1.00
rock	cy	380	7.00	3.00
Rip rap for dam	cy	6,800	2.50	2.50
Rock screening for filter	cy	3,200	4.00	3.00
Clay gravel road surface	cy	1,250	1.25	0.75
Pipe culverts, 24" corr metal	lf	36	7.00	6.00
36" corr met	lf	204	13.00	10.00
6" perforated asph coated drain tile	lf	80	1.50	2.00
6" asph coated corr drain tile	lf	160	1.50	2.00
creo trash racks	ea	2	100.00	202.00
trash screens	ea	2	300.00	424.00
Conc bridges	ea	1	30,218	40,038
Conc, CI a for intake tower	cy	290	40.00	84.00
spillway	cy	930	30.00	36.50
Conc, ci C, encasement for aerator pipe & 36" CI main	cy	400	30.00	30.75
Rubble conc masonry	cy	500	25.00	10.00
Reinf stl, bridge, parapet, & walk	lb	92,000	0.13	0.135
Guard rail	lf	1,150	2.50	3.00
Water main, install gates	ea	2	400.00	200.00
install 36" pipe	lf	505	4.00	3.00
install 20" aerator pipe	lf	606	4.00	3.00
install 36" CI pipe	lf	430	5.00	3.00
Core mat delivered at culvert site	cy	1,600	0.35	0.40
Sand delivered at culvert site	cy	21	3.00	4.00
Pervious mat, backfill, delivered at culvert site	cy	750	0.30	0.40
Perv mat, conc backfill, delivered at dam site	cy	575	22.00	1.00
Sand for grout, delivered at dam site	cy	25	3.00	4.00
Residence	ls	1	13,000	15,000

Logging road, Oregon

G. D. Dennis & Sons and G. D. Ranells Construction Co. have been awarded an $809,953 grading contract by the U. S. Dept. of Commerce, Bureau of Public Roads. A. H. Nelson is the engineer.

The Dennis-Rannels combination underbid eight other contractors, entering a bid 25% below the high bid by Eaton & Smith, San Francisco. However, the bid was less than 1% below the second low bid by Matt McDougall Co. An average of 3.6% separated each of the bids.

Work consists of grading 14.463 miles of the West Fork Smith River Road. Culverts up to 60 in. and 72 in. with flared inlets are included as are visible turnouts. The top width is to be 14 ft which allows a foot on either side for future erosion. Subgrade depth will vary from 12 to 24 in. The clearing was let in two units due to a definite change in the type of work.

Minimum wage rates on the project include: tractor operators, $2.65 per hr; hoist operators, $2.45 per hr; wagon drillers, $2.35 per hr; and general laborers, $2.10 per hr. The job will take 450 calendar days.

A charge to the loggers for the use of the road is expected to be levied.

Bidders include:

1C	G. D. Dennis & Sons & G. D. Ranells Const. Co., Portland, Oregon	$809,953
2	Natt McDougall Co., Portland, Oregon	816,470
9	Eaton& Smith, San Francisco,California	1,086,415

Bids. 7-21-53 Item	Unit	Quantity	Unit Prices 1C	2
Extra & miscell force account work	ls	1	$1,500	$1,500
Clearing	ac	70	650.00	790.00
Clearing	ac	55	700.00	925.00
Grubbing	ac	100	500.00	485.00
Rem trees & snags	sf	300	5.00	8.50
Solid rock excavation	cy	350,000	1.35	1.36
Common excavation	cy	279,000	0.40	0.38
Uncl exc for structures	cy	1,600	4.00	5.00
Station yd overhaul	stay	1,145,000	0.02	0.015
Cubic yd mile overhaul	cym	10,000	0.40	0.35
Bit coated corr sheet met culv pipe, type 1 18"	lf	4,700	6.25	5.45
18" (flared inlet)	lf	380	9.00	6.00
24" (flared inlet)	lf	56	11.00	8.90
60" (flared inlet)	lf	198	50.00	43.50
72" (flared inlet)	lf	126	67.00	55.90
Bit coated perf corr galv sheet met pipe underdrain 8	lf	300	5.00	4.50
Paved culv inlets, type 1	sy	70	20.00	15.00

OFFICIAL PROPOSALS

Bids: September 18, 1953

Installation of Water Mains to Reinforce Water Distribution System

LATHAM WATER DISTRICT
COLONIE, NEW YORK

Sealed bids for the unloading, hauling and installing of pipe for water mains to reinforce the water distribution system of the Latham Water District, Colonie, New York, will be received at the office of the Supervisor, William K. Sanford, Town Hall, Newtonville, New York, until 7.30 P.M., E.D.S.T. on the *18th* day of *September*, 1953, and then at said office, publicly opened and read aloud.

The work will consist of unloading, hauling and installing about 26,300 feet of 12 inch diameter, long length, Class 150, Bell and Spigot, cast iron pipe and about 9,400 feet of 10 inch diameter, 3,500 feet of 8 inch diameter and 2,000 feet of 6 inch diameter of same class and type of pipe, together with the specials and connections to existing water mains.

The Information for Bidders, Form of Contract, Plans, Specifications and Form of Performance Bond may be examined at the office of Keis & Holroyd, Consulting Engineers, 257 Broadway, Troy, New York. Copies thereof may be obtained at the said office of the Town Clerk or Keis & Holroyd, upon payment of $25.00 for each set. Any bidder upon returning such set promptly in good condition, will be refunded his payment and any non-bidder upon so returning such set within 30 days of date for receiving bids, will be refunded $20.00.

The Town Board, Colonie, New York, reserves the right to waive any informalities in or to reject any or all bids.

A certified check made payable to the order of the Supervisor of the Town of Colonie, New York, in the amount of 5% of the bid must be deposited by each bidder with his bid as a guarantee that in case the contract is awarded to him, that he will, within 5 days thereafter, execute such contract and furnish a satisfactory performance bond. On failure to do so he shall forfeit the deposit as liquidated damages, and acceptance of the bid will be contingent upon the fulfillment of this requirement by the Bidder.

The successful bidder will be required to furnish a performance bond satisfactory to the Town Board of Colonie, New York, in the amount of the contract and having as surety thereon such surety company or companies as are acceptable to the Town of Colonie, New York.

No Bidder may withdraw his bid within 30 days after the date set for the opening thereof. Any bid may be withdrawn prior to the above scheduled time for the opening of bids or authorized postponement thereof.

HAROLD R. McCABE, Town Clerk
Dated: August 20, 1953
KEIS & HOLROYD
ENGINEERS
TROY, NEW YORK

Bids: September 15, 1953

Construction of Electrical System

PENNSYLVANIA TURNPIKE
COMMISSION
Harrisburg, Pennsylvania
NOTICE TO BIDDERS

Sealed proposals will be received by the Pennsylvania Turnpike Commission through the Chairman, 11 North Fourth Street, Harrisburg, Pennsylvania until 10:00 A.M. (Eastern Daylight Saving Time) the 15th day of September 1953, and immediately thereafter will be taken to the Public Utility Commission's Hearing Room No. 1, North Office Building, State Capitol, Harrisburg, Pennsylvania and publicly opened and read aloud, for each of the following two groups of contracts:

For the construction of Electrical System for the Utility Building and Toll Plaza at each of the interchanges listed below in each group:

GROUP I

Contract No.	Interchange	Connecting Route	County
420-C	Valley Forge	U.S. 202	Montgomery
421-C	U.S. 422	U.S. 422	Montgomery
422-C	U.S. 309	U.S. 309	Montgomery

GROUP II

Contract No.	Interchange	Connecting Route	County
423-C	U.S. 611	U.S. 611	Montgomery
424-C	U.S. 1	U.S. 1 (New)	Bucks
425-C	U.S. 13	U.S. 13	Bucks

OFFICIAL PROPOSALS

The work to be performed under each of these two groups of contracts consists of the construction of Electrical System for the Utility Building and Toll Plaza and all work incident thereto at each of the three interchanges listed under each group. The Utility Buildings and Toll Plaza are to be constructed by others. Plumbing and Heating will be installed by others.

Copies of plans, specifications and Contract Documents are on file and open to public inspection on and after August 26, 1953, at the offices of the Pennsylvania Turnpike Commission in Harrisburg, Pennsylvania; at the Commission's field office in Conshohocken, Pennsylvania, 10th Avenue and Hallowell Street and at the Commission's field office in Bristol, Pennsylvania, 700 Canal Street.

Plans and Contract Documents which cover both groups of contracts may be obtained from the Commission upon deposit of Ten ($10.00) Dollars for each set, such deposits to be refunded in full to any actual bidder upon return of such documents in good condition within five (5) days after the date of the opening of the bids. Refund will be made for all plans and specifications returned, if the project is withdrawn from letting by the Pennsylvania Turnpike Commission.

Remittances are payable to the Pennsylvania Turnpike Commission and must accompany requests for drawings and specifications.

Copies of Specifications for grading, drainage, paving and structures may be purchased from the Pennsylvania Turnpike Commission for the sum of Five ($5.00) Dollars per copy.

The character and amount of bid security to be furnished by bidder is stated in the Instructions to Bidders.

No bids may be withdrawn for thirty (30) days after the scheduled closing time for receipt of bids.

The Pennsylvania Turnpike Commission reserves the right to waive any informalities in or to reject any or all bids.

James F. Torrance
Secretary and Treasurer
Harrisburg, Pennsylvania
19 August 1953

Bids: September 15, 1953

Construction of Heating System

PENNSYLVANIA, TURNPIKE
COMMISSION
Harrisburg, Pennsylvania
NOTICE TO BIDDERS

Sealed proposals will be received by the Pennsylvania Turnpike Commission through the Chairman, 11 North Fourth Street, Harrisburg, Pennsylvania until 10:00 A.M. (Eastern Daylight Saving Time) the 15th day of September 1953, and immediately thereafter will be taken to the Public Utility Commission's Hearing Room No. 1, North Office Building, State Capitol, Harrisburg, Pennsylvania and publicly opened and read aloud, for each of the following two groups of contracts:

For the construction of Heating System for the Utility Building and Toll Plaza at each of the interchanges listed below in each group.

GROUP I

Contract No.	Interchange	Connecting Route	County
420-B	Valley Forge	U.S. 202	Montgomery
421-B	U.S. 422	U.S. 422	Montgomery
422-B	U.S. 309	U.S. 309	Montgomery

GROUP II

Contract No.	Interchange	Connecting Route	County
423-B	U.S. 611	U.S. 611	Montgomery
424-B	U.S. 1	U.S. 1 (New)	Bucks
425-B	U.S. 13	U.S. 13	Bucks

The work to be performed under each of these two groups of contracts consists of the construction of Heating System for the Utility Building and Toll Plaza and all work incident thereto at each of the three interchanges listed under each group. The Utility Buildings and Toll Plaza are to be constructed by others. Plumbing and Electrical Work will be installed by others.

Copies of plans, specifications and Contract Documents are on file and open to public inspection on and after August 26, 1953, at the offices of the Pennsylvania Turnpike Commission in Harrisburg, Pennsylvania; at the Commission's field office in Conshohocken, Pennsylvania, 10th. Avenue and Hallowell Street and at the Commission's field office in Bristol, Pennsylvania, 700 Canal Street.

Plans and Contract Documents which

OFFICIAL PROPOSALS

cover both groups of contracts may be obtained from the Commission upon deposit of Ten ($10.00) Dollars for each set, such deposits to be refunded in full to any actual bidder upon return of such documents in good condition within five (5) days after the date of the opening of the bids. Refund will be made for all plans and specifications returned, if the project is withdrawn from letting by the Pennsylvania Turnpike Commission.

Remittances are payable to the Pennsylvania Turnpike Commission and must accompany requests for drawings and specifications.

Copies of Specifications for grading, drainage, paving and structures may be purchased from the Pennsylvania Turnpike Commission for the sum of Five ($5.00) Dollars per copy.

The character and amount of bid security to be furnished by bidder is stated in the Instructions to Bidders.

No bids may be withdrawn for thirty (30) days after the scheduled closing time for receipt of bids.

The Pennsylvania Turnpike Commission reserves the right to waive any informalities in or to reject any or all bids.

PENNSYLVANIA TURNPIKE
COMMISSION
James F. Torrance
Secretary and Treasurer
Harrisburg, Pennsylvania
19 August 1953

Bids: September 18, 1953

Grading, Drainage, Structures & Paving

OHIO TURNPIKE COMMISSION
139 East Gay Street
Columbus 15, Ohio

Contract C-34
Contract C-35
Contract C-34&35

Sealed proposals will be received by the Ohio Turnpike Commission until 10:00 A.M., Eastern Standard Time, September 18, 1953, for the performance of each of the Contracts enumerated above.

The work covered by Contract C-34 consists generally of the construction of grading, drainage, structures, and paving of approximately 3.7 miles in Construction Section 34 of Ohio Turnpike Project No. 1, beginning at a point about 3,100 feet east of Young Road at Turnpike Centerline Station 1219+39 in Sandusky County, and extending eastwardly to a point about 1,800 feet west of Billings Road at Turnpike Centerline Station 134+16.88 in Erie County, and the construction of engineer's office buildings and facilities on or near the site of the work.

The work covered by Contract C-35 consists generally of the construction of grading, drainage, structures, and paving of approximately 4.4 miles in Construction Section 35 of Ohio Turnpike Project No. 1, beginning at a point about 1,600 feet east of Dalton Road at Turnpike Centerline Station 985+97 in Sandusky County, and extending eastwardly to a point about 3,100 feet east of Young Road at Turnpike Station 1219+39 in Sandusky County, and the construction of engineer's office buildings and facilities on or near the site of the work.

In Construction Section 34, the principal structures to be built are one reinforced concrete box culvert, three single bridges, and one twin bridge (said twin bridge consisting of two separate but nearly identical and parallel structures). All of these bridges are steel beam bridges of from one to four spans each supported on reinforced concrete abutments and bents. The abutments of all of these bridges are to be on cast-in-place reinforced concrete piles. All of the bents are to be on spread footings.

In Construction Section 35, the principal structures to be built are six reinforced concrete box culverts, four single bridges, and three twin bridges (each twin bridge consisting of two separate but nearly identical and parallel structures). All of these bridges are steel beam bridges of from one to four spans each supported on reinforced concrete abutments and bents. The abutments of five bridges are to be on cast-in-place reinforced concrete piles and the abutments of two bridges are to be on spread footings. The bents of one bridge are to be on cast-in-place reinforced concrete piles and the bents of five bridges are to be on spread footings.

Approximate quantities of the major

(THIS ADVERTISEMENT CONTINUED ON PAGE 76)

OFFICIAL PROPOSALS

items of construction for Contract C-34 are as follows:

Roadway Excavation ..257,400 cubic yards
Borrow .....199,900 cubic yards
Structural Concrete.... 2,300 cubic yards
Reinforcing Steel.....323,000 pounds
Fabricated Structural Steel (excluding furnishing and fabrication)....717,000 pounds
Concrete Bearing Piles. 2,000 lineal feet
10" Reinforced Concrete Pavement .....103,000 square yards

Approximate quantities of the major items of construction for Contract C-35 are as follows:

Roadway Excavation ..690,000 cubic yards
Borrow .....396,300 cubic yards
Structural Concrete.... 10,600 cubic yards
Reinforcing Steel.... 1,427,000 pounds
Fabricated Structural Steel (excluding furnishing and fabrication).. 1,651,000 pounds
Concrete Bearing Piles. 1,700 lineal feet
10" Reinforced Concrete Pavement .....121,900 square yards

For each contract, fabricated structural steel and structural expansion and/or contraction joints will be furnished by the Commission.

Copies of the Plans and General Specifications for said Contracts are immediately available for public inspection or purchase at the office of the Chief Engineer, Ohio Turnpike Commission, 139 East Gay Street, Columbus 15, Ohio. These documents may be purchased from said Chief Engineer for the following sums, per set, which sums are non-returnable:

General Specifications for Ohio Turnpike Project No. 1.....$5.00
Plans (also soil profiles and boring logs), per set, per construction section 15.00
Cross Sections, per set, per construction section 25.00

Forms or copies of all remaining Contract Documents, including Proposals for each of the Contracts set forth above, of the Affidavit which must accompany any such Proposal, of this Notice to Bidders, of the Special Provisions applying to said Contracts, of the Contract to be entered into with the (or each) successful Bidder, and of the Contract Bond to be furnished with such Contract will be furnished upon request and without charge to any interested person at the aforesaid Chief Engineer's office on and after 3:00 P. M., Eastern Standard Time, August 21, 1953.

All Proposals must be on the form prescribed by the Commission and must comply with the terms and conditions set forth in the contract Documents.

Each Proposal must be accompanied by a certified check or checks on a solvent bank or banks, payable to the order of the Ohio Turnpike Commission in an amount not less than $100,000 per Construction Section covered by the Contract on which the Bidder bids. If the Bidder shall tender bids for more than one Contract, said amount shall be not less than $100,000 per Construction Section covered by the Contracts on which he shall tender Proposals; provided, however, that if one or more Construction Sections are included in more than one Contract for which the Bidder shall tender Proposals, the Bidder need furnish only $100,000 per each such section, notwithstanding such duplication. The Commission may at any time cash any such check. Each such check or the proceeds thereof will be held by the Commission as a guaranty that, if any Proposal guaranteed thereby is accepted, a Contract will be entered into and the performance of the Proposal secured.

Each such check or the proceeds thereof will be returned or forfeited as provided in paragraphs G-3.03 and G-3.06 of the aforesaid General Specifications, provided that if there be a forfeiture, it shall be of an amount equal to $100,000 per Construction Section covered by the Proposal with respect to which the forfeiture occurs, and any excess will be returned to the Bidder.

All bids must be received at or before 10:00 A. M., Eastern Standard Time, September 18, 1953, in the offices of the Ohio Turnpike Commission, 139 East Gay Street, Columbus 15, Ohio. At said hour, the bid box will be removed to the Neil House Hotel, 41 South High Street, Columbus, Ohio, where all proposals will be publicly opened and read.

The award of any of the above-enumerated Contracts, if any award be made, will be to the Bidder or Bidders whose Proposal or combination of Proposals is lowest and best for the performance of the work, taken as a whole, and complies with all the prescribed requirements. The Commission reserves the right to reject any or all Proposals and to waive technicalities.

OHIO TURNPIKE COMMISSION

OFFICIAL PROPOSALS

Bids: September 15, 1953

Construction of Plumbing System

PENNSYLVANIA TURNPIKE COMMISSION
Harrisburg, Pennsylvania
NOTICE TO BIDDERS

Sealed proposals will be received by the Pennsylvania Turnpike Commission through the Chairman, 11 North Fourth Street, Harrisburg, Pennsylvania until 10.00 A.M. (Eastern Daylight Saving Time) the 15th day of September 1953, and immediately thereafter will be taken to the Public Utility Commission's Hearing Room No. 1, North Office Building, State Capitol, Harrisburg, Pennsylvania and publicly opened and read aloud, for each of the following two groups of contracts:

For the construction of Plumbing System for the Utility Building and Toll Plaza at each of the interchanges listed below in each group:

GROUP I

Contract No.	Interchange	Connecting Route	County
420-A	Valley Forge	U.S. 202	Montgomery
421-A	U.S. 422	U.S. 422	Montgomery
422-A	U.S. 309	U.S. 309	Montgomery

GROUP II

Contract No.	Interchange	Connecting Route	County
423-A	U.S. 611	U.S. 611	Montgomery
424-A	U.S. 1	U.S. 1 (New)	Bucks
425-A	U.S. 13	U.S. 13	Bucks

The work to be performed under each of these two groups of contracts consists of the construction of Plumbing System for the Utility Building and Toll Plaza and all work incident thereto at each of the three interchanges listed under each group. The Utility Buildings and Toll Plaza are to be constructed by others. Heating and Electrical Work will be installed by others.

Copies of plans, specifications and Contract Documents are on file and open to public inspection on and after August 26, 1953, at the offices of the Pennsylvania Turnpike Commission in Harrisburg, Pennsylvania; at the Commission's field office in Conshohocken, Pennsylvania, 10th. Avenue and Hallowell Street and at the Commission's field office in Bristol, Pennsylvania, 700 Canal Street.

Plans and Contract Documents which cover both groups of contracts may be obtained from the Commission upon deposit of Ten ($10.00) Dollars for each set, such deposits to be refunded in full to any actual bidder upon return of such documents in good condition within five (5) days after the date of the opening of the bids. Refund will be made for all plans and specifications returned, if the project is withdrawn from letting by the Pennsylvania Turnpike Commission.

Remittances are payable to the Pennsylvania Turnpike Commission and must accompany requests for drawings and specifications.

Copies of Specifications for grading, drainage, paving and structures may be purchased from the Pennsylvania Turnpike Commission for the sum of Five ($5.00) Dollars per copy.

The character and amount of bid security to be furnished by bidder is stated in the Instructions to Bidders.

No bids may be withdrawn for thirty (30) days after the scheduled closing time for receipt of bids.

The Pennsylvania Turnpike Commission reserves the right to waive any informalities in or to reject any or all bids.

PENNSYLVANIA TURNPIKE COMMISSION
James F. Torrance
Secretary and Treasurer

Harrisburg, Pennsylvania
19 August 1953

Bids: September 15, 1953

Construction of Utility Building & Toll Plaza

PENNSYLVANIA TURNPIKE COMMISSION
Harrisburg Pennsylvania
Notice to Bidders

Sealed proposals will be received by the Pennsylvania Turnpike Commission through the Chairman 11 North Fourth Street, Harrisburg, Pennsylvania until 10:00 A.M. (Eastern Daylight Saving Time) the 15th day of September 1953, and immediately thereafter will be taken to the Public Utility Commission's Hearing Room No. 1, North Office Building, State Capitol, Harrisburg, Pennsylvania and publicly opened and read aloud, for each of the following two groups of contracts:

For the construction of Utility Building and Toll Plaza at each of the interchanges listed below in each group.

GROUP I

Contract No.	Interchange	Connecting Route	County
420	Valley Forge	U.S. 202	Montgomery
421	U.S. 422	U.S. 422	Montgomery
422	U.S. 309	U.S. 309	Montgomery

GROUP II

Contract No.	Interchange	Connecting Route	County
423	U.S. 611	U.S. 611	Montgomery
424	U.S. 1	U.S. 1 (New)	Bucks
425	U.S. 13	U.S. 13	Bucks

The work to be performed under each of these two groups of contracts consists of the construction of the Utility Building and Toll Plaza and all work incident thereto at each of the three interchanges listed under each group; not including, however, the Plumbing, the Heating System, the Electrical work or the Seeding and Sodding, except as noted in the specifications or as shown on the contract drawings.

Copies of plans, specifications and Contract Documents are on file and open to public inspection on and after August 26, 1953, at the offices of the Pennsylvania Turnpike Commission in Harrisburg, Pennsylvania, at the Commission's field office in Conshohocken, Pennsylvania, 10th Avenue and Hallowell Street and at the Commission's field office in Bristol, Pennsylvania, 700 Canal Street.

Plans and Contract Documents which cover both groups of contracts may be obtained from the Commission upon deposit of Ten ($10.00) Dollars for each set, such deposits to be refunded in full to any actual bidder upon return of such documents in good condition within five (5) days after the date of the opening of the bids. Refund will be made for all plans and specifications returned, if the project is withdrawn from letting by the Pennsylvania Turnpike Commission.

Remittances are payable to the Pennsylvania Turnpike Commission and must accompany requests for drawings and specifications.

Copies of Specifications for grading, drainage, paving and structures may be purchased from the Pennsylvania Turnpike Commission for the sum of Five ($5.00) Dollars per copy.

The character and amount of bid security to be furnished by bidder is stated in the Instructions to Bidders.

No bids may be withdrawn for thirty (30) days after the scheduled closing time for receipt of bids.

The Pennsylvania Turnpike Commission reserves the right to waive any informalities in or to reject any or all bids.

PENNSYLVANIA TURNPIKE COMMISSION
James F. Torrance
Secretary and Treasurer

Harrisburg, Pennsylvania
19 August 1953

OFFICIAL PROPOSALS

RATE: The rate for Official Proposal Advertising is $1.00 per line (or fraction) per insertion.

COPY RECEIVED: up to 3:00 P.M. Friday for issue out following Thursday subject to space open for last minute ads.

SEND COPY: to Official Proposal Division, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-4017) will be received at Casper, Wyoming, until 10:30 a.m., September 22, 1953, for furnishing labor and materials for earthwork, asphaltic membrane lining, and structures, Fort Laramie Canal, North Platte Project, Wyoming-Nebraska. Location: Between Torrington, Wyoming and Gering, Nebraska. Principal items are: 147,000 cu. yds. excavation from canal and borrow; furnishing and applying 1670 tons asphalt for membrane lining; placing 111,000 cu. yds. earth cover and gravel on lining, constructing 11 concrete drainage inlets; and other work. The work is divided into two schedules. Completion time 180 days. For particulars, address Bureau of Reclamation, Box 280, Casper, Wyoming; or Building 53, Denver Federal Center, Denver, Colorado.

W. A. DEXHEIMER, Commissioner

OFFICIAL PROPOSALS

Bids: September 10, 1953

Oil Fired Space Heater Naval Industrial Reserve Shipyard Building No. 15 Port Newark, N. J.

THE PORT OF NEW YORK AUTHORITY
CONTRACT O & M-189
PROPOSAL NO. 217

Sealed proposals for furnishing all labor, material and equipment necessary to install an oil fired space heater in Building No. 15 at the Naval Industrial Reserve Shipyard, Port Newark, N. J., will be received at the office of the Director of Purchase of The Port of New York Authority, Room 900, 111 8th Ave., New York 11, until 11:00 A.M. (E.D.S.T.) on Thursday, September 10, 1953, at which time and place said proposals will be publicly opened and read.

Contract documents may be obtained upon request at the office of the Director of Purchase.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman, Chairman
New York, August 27, 1953

Bids: September 18, 1953

Grading, Drainage, Structures & Paving

OHIO TURNPIKE COMMISSION
139 East Gay Street
Columbus 15, Ohio
Contract C-20
Contract C-21
Contract C-20 & 21

Sealed proposals will be received by the Ohio Turnpike Commission until 10:00 A. M., Eastern Standard Time, September 18, 1953, for the performance of each of the Contracts enumerated above.

The work covered by Contract C-20 consists generally of the construction of grading, drainage, structures, and paving of approximately 3.1 miles in Construction Section 20 of Ohio Turnpike Project No. 1, beginning at a point about 3,800 feet east of Usher Road at Turnpike Centerline Station 191+00 and extending eastwardly to a point about 2,250 feet east of Prospect Road at Turnpike Centerline Station 354+64, all in Cuyahoga County, and the construction of an engineer's office building and facilities on or near the site of the work.

The work covered by Contract C-21 consists generally of the construction of grading, drainage, structures, and paving of approximately 3.5 miles in Construction Section 21 of Ohio Turnpike Project No. 1, beginning at a point about 500 feet east of the Lorain County-Cuyahoga County Line at Turnpike Centerline Station 5+00 and extending eastwardly to a point approximately 3,800 feet east of Usher Road at Turnpike Centerline Station 191±00, all in Cuyahoga County, and the construction of engineer's office buildings and facilities on or near the site of the work.

The work covered by Contract C-20&21, which covers a combination of Construction Sections 20 and 21, is the construction as above generally described for the individual Construction Sections, taken together.

In Construction Section 20, the principal structures to be built are two reinforced concrete box culverts, two single steel beam bridges, two twin steel beam bridges (each twin bridge consisting of two separate but nearly identical and parallel structures), and two steel plate girder bridges. All of the steel beam bridges are from three to four spans each and each of the steel plate girder bridges is of five spans. All of the bridges are supported on reinforced concrete abutments and bents. The abutments of the bridges are to be on steel piles and the bents are to be on spread footings.

In Construction Section 21, the principal structures to be built are six reinforced concrete box culverts, and three single bridges. All of these bridges are steel beam bridges of four spans each supported on reinforced concrete abutments and bents. The abutments are to be on steel piles and the bents are to be on spread footings.

Approximate quantities of the major items of construction for Contract C-20 are as follows:

Roadway Excavation	710,000 cubic yards
Structural Concrete	11,300 cubic yards
Reinforcing Steel	1,768,000 pounds
Fabricated Structural Steel (excluding furnishing and fabrication)	4,615,000 pounds
10" Reinforced Concrete Pavement	86,000 square yards

Approximate quantities of the major items of construction for Contract C-21 are as follows:

Roadway Excavation	195,000 cubic yards
Borrow	119,000 cubic yards
Structural Concrete	5,800 cubic yards
Reinforcing Steel	810,000 pounds
Fabricated Structural Steel (excluding furnished and fabrication)	745,000 pounds
10" Reinforced Concrete Pavement	99,000 square yards

For each Contract, fabricated structural steel and structural expansion and/or contraction joints will be furnished by the Commission.

Copies of the Plans and General Specifications for said Contracts are immediately available for public inspection or purchase at the office of the Chief Engineer, Ohio Turnpike Commission, 139 East Gay Street, Columbus 15, Ohio. These documents may be purchased from said Chief Engineer for the following sums, per set, which sums are non-returnable:

General Specifications for Ohio Turnpike Project No. 1	$ 5.00
Plans (also soil profiles and boring logs), per set, per construction section	15.00
Cross Sections, per set, per construction section	25.00

Forms or copies of all remaining Contract Documents, including Proposals for each of the Contracts set forth above, the Affidavit which must accompany any such Proposal, this Notice to Bidders, the Special Provisions applying to said Contracts, the Contract to be entered into with the (or each) successful Bidder, and the Contract Bond to be furnished with such Contract, will be furnished upon request and without charge to any interested person at the aforesaid Chief Engineer's office on and after 3:00 P.M., August 21, 1953.

All Proposals must be on the form prescribed by the Commission and must comply with the terms and conditions set forth in the Contract Documents.

Each proposal must be accompanied by a certified check or checks on a solvent bank or banks, payable to the order of the Ohio Turnpike Commission in an amount not less than $100,000 per Construction Section covered by the Contract on which the Bidder bids. If the Bidder shall tender bids for more than one Contract, said amount shall be not less than $100,000 per Construction Section covered by the Contracts on which he shall tender Proposals; provided, however, that if one or more Construction Sections are included in more than one Contract for which the Bidder shall tender Proposals, the Bidder need furnish only $100,000 per each such section, notwithstanding such duplication. The Commission may at any time cash any such check. Each such check or the proceeds thereof will be held by the Commission as a guaranty that, if any Proposal guaranteed thereby is accepted, a Contract will be entered into and the performance of the Proposal secured.

Each such check or the proceeds thereof will be returned or forfeited as provided in paragraphs G-3.03 and G-3.06 of the aforesaid General Specifications, provided that if there be a forfeiture, it shall be of an amount equal to $100,000 per Construction Section covered by the Proposal with respect to which the forfeiture occurs, and any excess will be returned to the Bidder.

All bids must be received at or before 10:00 A.M., Eastern Standard Time, September 18, 1953, in the offices of the Ohio Turnpike Commission, 139 East Gay Street, Columbus 15, Ohio. At said hour, the bid box will be removed to the Nell House Hotel, 41 South High Street, Columbus, Ohio, where all Proposals will be publicly opened and read.

The award of any of the above-enumerated Contracts, if any award be made, will be to the Bidder or Bidders whose Proposal or combination of Proposals is lowest and best for the performance of the work, taken as a whole, and complies with all the prescribed requirements. The Commission reserves the right to reject any or all Proposals and to waive technicalities.

OHIO TURNPIKE COMMISSION

Bids: September 8, 1953

Paving

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Department for:

PALISADES INTERSTATE PARKWAY, SECTION 1-G

Palisades Interstate Parkway, Section 1-G, Paving, from Station 319+0 to Station 413+0, Borough of Alpine, Bergen County. Length 1.780 miles. The principal items of construction are:

Estimated:
5,000 cu. yds. Roadway Excavation—Earth
8,500 cu. yds. Borrow Excavation
19,957 cu. yds. Subbase
40,054 sq. yds. Stabilized Turf Shoulders, 6" thick
56,705 sq. yds. Macadam Base Course, 8" thick
55,204 sq. yds. Pavement Type MA-BC-2; 3" thick
1,138 lin. ft. 6" Corrugated Metal Culvert Pipe
21,139 lin. ft. White Concrete Curb
9,460 lin. ft. Rough Cut Timber Guard Rail

Bids for the above will be received at the office of the State Highway Department, Assembly Room, Room 140, in the State Highway Office Building, 1035 Parkway Avenue, Trenton, N. J., on Tuesday, September 8, 1953, at ten o'clock (10:00 A.M.—EASTERN STANDARD TIME), eleven o'clock (11:00 A.M.—DAYLIGHT SAVING TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plant and equipment with their bid.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, New Jersey, and may be inspected by prospective bidders during office hours. Plans will be furnished on a deposit of Ten Dollars ($10.00) for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 139, State Highway Office Building, 1035 Parkway Avenue, Trenton, N. J. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: A. Lee Grover, Chief Clerk
State Highway Department

Sewage Treatment Plant

NOTICE TO CONTRACTORS

Sealed Proposals for the construction of Contract No. 2 of the Village Creek Sewage Treatment Plant will be received by the Jefferson County Commission, Jefferson County, Alabama, at the Jefferson County Court House, Commission Chamber until 10:00 A.M. o'clock C.S.T. on September 22, 1953 at which time and place they will be publicly opened and read.

Plans, specifications, and contract documents are open to public inspection at the office of C. J. Rogers, County Engineer, Room 206, Courthouse, and at the offices of J. W. Goodwin Engineering Co., 2111

(Continued on page 79)

OFFICIAL PROPOSALS

Bids: September 3, 1953

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS.

OFFICIAL PROPOSALS

ALBANY, N. Y.,—Pursuant to the provisions of the Highway Law, Public Buildings Law, and Article 2, Title 9 of the Public Authorities Law, and special provisions for projects financed with Federal Aid funds, sealed proposals will be received until ten-thirty o'clock A.M., advanced standard

OFFICIAL PROPOSALS

time, which is nine-thirty o'clock A.M., eastern standard time, on the 3rd day of September 1953, by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
		DISTRICT No. 1				
		G. L. Nickerson, District Engineer, 353 Broadway, Albany, New York				
Rensselaer	FASS 53-10	Petersburg Junction-Hoosick Co. Rd.; Proj. S-385(1)	1.73	T. C. Bit. Mac. (Pen. Method) Type 1	$8,000 Plans $10	$144,000
Schenectady	U.S. 88	Lock 7, Barge Canal, Niskayuna	.....	Extending Upper Lock Gate, Removing and Replacing Lower Lock Gate and Misc. Work	5% of Bid Plans $10	Not Published
		DISTRICT No. 2				
		Lacy Ketchum, District Engineer, 109 No. Genesee St., Utica, New York				
Herkimer	M.T. 53-13	New York State Thruway—Mohawk Sect.-Sub. 10B (East Schuyler-Fort Herkimer)	0.22	9" Cem. Conc. Pavt. 2 @ 25' Wide Hy. R.R. Comp. Girder and I-Beam 776.4'	$130,000 Plans $25	$2,338,000
Hamilton	FASSH 53-11	Speculator-Indian Lake Pt. 1; Proj. S-503(3)	10.66	D.S.T. Graded Grav. Comp. I-Beam Br. 55'	$100,000 Plans $50	1,854,000
		DISTRICT No. 6				
		J. H. Thomas, District Engineer, 30 West Main St., Hornell, New York				
Allegany	FASS 53-11	Knights Creek-Scio Co. Rd. 9; Scio-Vandermark Creek Co. Rd. 10; Proj. S-789(3)(4)	1.10	Bit. Mac. Ty. 1 Pen. Method 4 Comp. I-Beam Brs. 92', 100', 146.5' and 160'	$31,000 Plans $25	604,000
		DISTRICT No. 9				
		F. W. Donovan, District Engineer, 71 Frederick St., Binghamton, New York				
Otsego	Chp. 23 Sec. 10 Laws 1953 Chp. 103 Sec. 11 Laws 1945	County Assistant Engineers' Storehouse and Office	.....	Chain Link Fence and Gates, Grading, Drainage, Driveways and Landscaping	$1,700 Plans $10	31,000
		DISTRICT No. 10				
		M. Gotl, District Engineer, Montauk Highway at Little East Neck Rd., Babylon, L. I., New York				
Bronx	FACBE 53-1	Cross Bronx Expressway Contract 6A (3rd Ave. El. R.R.); Proj. UI-1084(1)	0.20	Raising Exist. R.R. Structure. R.R. Sep. Thru Girder 94.7'	$60,000 Plans $15	1,131,000
Nassau	FARC 53-110 SS 53-13	North Hempstead Turnpike S.H. 9018; Middle Neck Road S.H. 9019; Old Middle Neck Rd. Co. Rd. 251; Proj. U-541(9)	1.48	Drainage and Misc. Work	$25,000 Plans $10	462,000
Suffolk	FARC 53-111	Sag. Harbor Village S.H. 1206; Proj. F-859(2)	1.41	Asp. Conc. Ty. 1A, Opt.	$13,000 Plans $10	233,000
Suffolk	FASS 53-12	Hauppauge-Nesconset Co. Rd. 85; Proj. S-349(2)	4.69	Asp. Conc. Ty. 1A, Opt.= 4.49 Mi. 9" Cem. Conc. Pavt. Var. Wide = 0.20 Mi.	$60,000 Plans $15	1,120,000

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts and Accounts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement, and to the special provisions applying to projects financed with federal funds.

Award of a contract is subject to the "Controlled Materials Plan" of the National Production Authority as well as to regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instructions to Bidders."

When optional types are permitted on contracts with federal funds, bidders must state in the space provided in the proposal the exact designation of the optional type upon which the proposal is predicated.

The right is reserved to reject any or all bids.

B. D. TALLAMY
SUPT. OF PUBLIC WORKS

Bids: September 3, 1953

THE CENTRAL RAILROAD COMPANY OF NEW JERSEY
GRADE CROSSING ELIMINATIONS THROUGH DUNELLEN AND PLAINFIELD, NEW JERSEY
UNDER ORDER OF THE PUBLIC UTILITY COMMISSION, STATE OF NEW JERSEY

Sealed proposals will be received by The Central Railroad Company of New Jersey, at the office of the Chief Engineer, located at Jersey City Terminal, Room No. 44, Foot of Johnston Ave., Jersey City, N. J., until 1:00 P.M., Thursday, September 3, 1953, and publicly read at that time, for the:—

Furnishing and erection of structural steel for four railroad bridges, i.e. Rock Avenue, Plainfield, Union County; Washington Avenue, Prospect Avenue and Madison Avenue, Borough of Dunellen, Middlesex County, New Jersey.

Principal quantities involved are:—

1,289,600 lbs. Carbon Structural Steel
162,800 lbs. Silicon Structural Steel
39,000 lbs. Steel Castings
1,230 lbs. Bronze Plates

Proposal forms, drawings, specifications, bond and insurance requirements may be obtained at the office of the Chief Engineer of the Railroad Company, at the above address, on or after August 21st, 1953.

The Railroad Company reserves the right to reject any or all proposals.

S. L. Mapes, Chief Engineer,
The Central Railroad Company of New Jersey, Jersey City Terminal, Jersey City 2, N. J. August 7, 1953.

Bids: September 4, 1953

Delaware River Joint Toll Bridge Commission

ADMINISTRATION BUILDING
MORRISVILLE, PENNSYLVANIA
NOTICE TO CONTRACTORS

Sealed proposals for "Painting Steel" of three structural steel highway bridges over the Delaware River, between Pennsylvania and New Jersey located as follows:

CONTRACT NO. 108 DELAWARE WATER GAP BRIDGE approximately one mile upstream from the Point of the Gap, in the vicinity of the town of Delaware Water Gap, Pennsylvania.

CONTRACT NO. 208—PORTLAND-COLUMBIA BRIDGE approximately 1,400 feet downstream from the existing covered bridge between Portland, Pennsylvania and Columbia, New Jersey.

CONTRACT NO. 308—MILFORD-MONTAGUE BRIDGE approximately 1,600 feet downstream from the existing bridge between Milford, Pennsylvania and Montague, New Jersey.

will be received by the Delaware River Joint Toll Bridge Commission at its office, Administration Building, Morrisville, Pennsylvania, until eleven o'clock (11:00 a.m.), Eastern Standard Time, on the 4th day of September 1953, at which time and place all bids will be publicly opened and read aloud.

PAINT AND THINNERS ARE TO BE FURNISHED BY THE COMMISSION.

"Painting Steel" includes the following work:

1. Clean all steel as necessary for painting.
2. Apply touch-up coat of paint to all areas where shop coat is missing or damaged.
3. Apply three (3) field coats of paint to all steel.
4. Clean rust stains from the concrete and granite facing of the piers and from the face of the abutments.

The DELAWARE WATER GAP BRIDGE has approximately 5,690 tons of steel to be painted with thirty-one piers and two abutments to clean.

The PORTLAND-COLUMBIA BRIDGE has approximately 1,530 tons of steel to be painted with nine piers and two abutments to clean.

The MILFORD-MONTAGUE BRIDGE has approximately 1,270 tons of steel to be painted with three piers and two abutments to clean.

After August 17, 1953, Instructions to Bidders, Form of Proposal, Form of Contract, Form of Performance Bond, and Specifications may be examined at the offices of the Commission, Morrisville, Pa., or Administration Building, Phillipsburg, New Jersey, and copies thereof obtained upon payment of five dollars ($5.00) for each set (the set contains the documents for the three bridges) which amount is not returnable.

Proposals may be submitted for the painting of each bridge separately, for two bridges combined or for all three bridges combined.

Each Proposal must be accompanied by a certified check in the amount of not less than five (5) percent of the amount of the Proposal.

If the bidder submits Proposals for more than one contract, a single certified check in the amount of not less than five (5) percent of the largest value of work included in a combination of proposals, will be sufficient.

All checks shall be made payable to the Delaware River Joint Toll Bridge Commission, which amounts shall be forfeited as liquidated damages if the bidder or bidders fail, within ten (10) consecutive calendar days after written notice that the bidder or bidders have been awarded the contract, to enter into a written contract with the Commission in accordance with the accepted bid, and to give a Peformance Bond satisfactory to the Commission, equal to one hundred percent (100%) of the amount of the contract.

The Commission reserves the right to waive any informalities in the bids received; to reject any or all bids, and to award the contract only to those experienced in this class of work, and to the bidder whose proposal is deemed by the Commission to be the most advantageous.

DELAWARE RIVER JOINT TOLL BRIDGE COMMISSION
By Alexander R. Miller
Chairman of Commission

Date: August 14, 1953

OFFICIAL PROPOSALS
(Continued from page 77)

7th Ave. South, Birmingham, Alabama, or maybe obtained from J. W. Goodwin Engineering Company, upon deposit of $100.00. The full amount of deposit for one set of documents will be refunded (with deductions not exceeding the actual cost of the documents) upon return of all documents in good condition within three (3) days after the date of opening of bids.

The work to be constructed hereunder consists principally of the following approximate quantities:

PROPOSAL

36,000 C.Y. Special Excavation; 11,000 C.Y. Earth Excavation; 500 C.Y. Foundation Backfill; 22,000 C.Y. Rock Excavation; 1,500 C.Y. Slag Leveling Course; 500 C.Y. Class "B" Concrete; 1 L.S. Yard Piping; 1,500 C.Y. Slag Backfill for Pipe; 1,500 C.Y. Special Pipeline Excavation; 1 L.S. Plant Storm Sewer System; 1 L.S. Intercepting Storm Sewer; 1 L.S. Sanitary Sewer and Structures; 1 L.S. Air Supply System; 1,585 S.Y. Type "A" Waterproofing; 6,800 S.Y. Stabilized Macadam Base; 6,800 S.Y. Bituminous Plant Mix; 4,875 L.F. Combination Concrete Curb and Gutter; 700 S.Y. Concrete Sidewalk; 45,000 C.Y. Yard Leveling; 38,400 C.Y. Borrow Excavation; 12 Acre Ground Preparation, zone "B"; 5,000 C.Y. Slope Flushing Material; 3,600 C.Y. Loamy Topsoil for Zone "A"; 4,000 C.Y. Loamy Topsoil for Cut and Fill Slopes; 18.90 Acre Seeding; 3,500 M. Gal. Watering; 23,000 S.Y. Solid Sodding; 23,000 S.Y. Dry Rip-Rap; 23,000 S.Y. Grouted Rip-Rap; 4,750 L.F. Fence; 1 L.S. 40 M.G.D. Sewage Treatment Plant.

A Performance Bond will be required of the successful bidder in the amount of 100% of the contract price. A Labor and Material Bond will be required of the successful bidder in the amount of 50% of the contract price.

Attention of Bidders is called to the License required by Act No. 297 of General Laws of the Legislature of Alabama, approved September 2, 1935, entitled "An Act to Regulate the Licensing of General Contractors", and that it will be necessary for all persons submitting bids for work involving Ten Thousand Dollars or more to show satisfactory evidence of license as a general contractor. No Plans, specifications or proposal forms herein will be issued to other than licensed general contractors or their authorized agents.

Bids must be accompanied by a certified check or Bidder's Bond in an amount not less than five (5) percent of the base bid.

No bid may be withdrawn after the scheduled closing time for the receipt of bids for a period of sixty days.

The Owner reserves the right to reject any and all bids, and to waive informalities.

JEFFERSON COUNTY COMMISSION
By: W. D. Kendrick, President
Attest: T. S. Lucius, Chief Clerk

J. W. GOODWIN ENGINEERING CO.
2111 7th Avenue South, Birmingham, Ala.

Bids: September 8, 1953

State Road Work

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Department for:

ROUTE 21, SECTION 4D

Route 21, Section 4D, from Herbert Place to Riverside Avenue; Bridges, Walls & Grading, City of Newark, Essex County. Federal Project No. U-126(4). Length 0.320 mile. The principal items of construction are:

Estimated:

Roadway Items
3,080 cu. yds. Roadway Excavation—Earth
28,379 cu. yds. Borrow Excavation
8,319 cu. yds. Porous Fill
1,026 lin. ft. Reinforced Concrete Pipe
17 Manholes and Inlets
36,464 cu. yds. Suppl. Borrow Excavation
2,000 cu. yds. Rock Fill
Bridge Items
15,000 cu. yds. Concrete in Structures
658,000 lbs. Structural Steel
467,300 lbs. Reinf. Steel, in Structures
103 lin. ft. 91" x 91" Flat Base Pipe
1,710 cu. ft. Concrete Crib Wall
6,300 lin. ft. Treated Timber Piles
3 Lighting Systems, Complete

Bids for the above will be received at the office of the State Highway Department, Assembly Room, Room 140, in the State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey, on Tuesday, September 8, 1953, at ten o'clock (10:00 A.M.—EASTERN STANDARD TIME), eleven o'clock (11:00 A.M.—DAYLIGHT SAVING TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plant and equipment with their bid.

NOTE: The proposed project is a "Federal Aid Project" authorized by the provisions of Title 27 of the revised statutes of New Jersey and supplements, and by P.L. 413, 82nd Congress, and is to be performed in accordance with the special provisions and requirements of the Bureau of Public Roads, Department of Commerce, as outlined in the specifications, which provisions require that labor be employed from lists furnished by the State Employment Service, 309 Washington Street, Newark, New Jersey. The attention of bidders is directed to the special provisions covering subletting or assigning the contract. The minimum wage paid to all common labor employed on this contract shall be $0.75 per hour. The minimum wage paid to all intermediate grade of labor employed on this contract shall be $1.00 per hour. The minimum wage paid to all skilled labor employed on this contract shall be $1.50 per hour.

Drawings, specifications and form of bid, contract and bond for the proposed work are in file in the office of the State Highway Department, Trenton, New Jersey, and may be inspected by prospective bidders during office hours. Plans will be furnished on a deposit of Ten Dollars ($10.00) for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 139, State Highway Office Building, 1035 Parkway Ave., Trenton, N. J. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids. Signed: A. Lee Grover, Chief Clerk
State Highway Department

Bids: September 8, 1953

State Road Work

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Department for:

ROUTE 24, SECTION 23

Construction of Route 24, Section 23, between Stewartsville Heights and New Village, Townships of Greenwich and Franklin, Warren County. Federal Project No. F-32(10). Length 0.892 miles. The principal items of construction are:

Estimated:
5,827 cu. yds. Roadway Excavation-Earth
500 cu. yds. Roadway Excavation-Rock
4,833 sq. yds. Pavement Excavation
6,120 cu. yds. Subbase
7,142 sq. yds. Penetration Gravel Shoulder 2" Thick
7,142 sq. yds. Gravel Base Course 6" Thick
13,092 sq. yds. Conc. Pavement Surf. Reinforced 9" Thick
4,300 lin. ft. Underdrain Type F
2,362 lin. ft. Reinforced Concrete Pipe
112 lin. ft. 58"x36" Corrug. Metal Pipe Arch
14 Inlets
1,149 lin. ft. 9" x 20" Wh Conc. Vert. Curb

Bids for the above will be received at the office of the State Highway Department, Assembly Room, Room 140, in the State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey, on Tuesday, September 8, 1953, at ten o'clock (10:00 A.M.—EASTERN STANDARD TIME), eleven o'clock (11:00 A.M.—DAYLIGHT SAVING TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plant and equipment with their bid.

NOTE: The proposed project is a "Federal Aid Project" authorized by the provisions of Title 27 of the revised statutes of New Jersey and supplements, and by P. L. 413, 82nd Congress, and is to be performed in accordance with the special provisions and requirements of the Bureau of Public Roads, Department of Commerce, as outlined in the specifications, which provisions require that labor be employed from lists furnished by the State Employment Service, Municipal Building, South Main Street Phillipsburg, New Jersey. The attention of bidders is directed to the special provisions covering subletting or assigning the contract. The minimum wage paid to all common labor employed on this contract shall be $0.75 per hour. The minimum wage paid to all intermediate grade of labor employed on this contract shall be $1.00 per hour. The minimum wage paid to all skilled labor employed on this contract shall be $1.50 per hour.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, New Jersey, and may be inspected by prospective bidders during office hours. Plans will be furnished on a deposit of Ten Dollars ($10.00) for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 139, State Highway Office Building, 1035 Parkway Ave., Trenton, N. J. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: A. Lee Grover, Chief Clerk
State Highway Department

Bids: September 15, 1953

Paving & Drainage

Sealed proposals will be received by the West Virginia Turnpike Commission for:
CONTRACTS NOS. 30, 30A, 30B, 30C, 30D

The work to be done under this Contract consists in performing the required Paving and Drainage for approximately 30 miles of the West Virginia Turnpike, including curbs, gutters, toll plaza, and miscellaneous items to complete the project, ready for traffic. This work is located between Ghent, Mile 20, and Mossy, Mile 50, Raleigh and Fayette Counties, West Virginia, and is in connection with the construction of the West Virginia Turnpike in the State of West Virginia.

The principal items of work include:

Contract 30	Approximate Quantity Rigid Type Alt. 1	Flexible Type Alt. 2
Rigid Pavement, Alternate 1		
Cement concrete pavement	580,000 s. y.	
Flexible Pavement, Alternate 2		
Asphaltic concrete pavement		100,000 tons
Other Items		
Culvert pipes and underdrains	13,000 l. f.	13,000 l. f.
Select subbase	1,000,000 tons	1,000,000 tons
Macadam base aggregate	43,000 tons	250,000 tons
Emulsified asphalt	675,000 gals.	3,800,000 gals.

Quantities tabulated above are divided approximately as follows:
30A — 25%, 30B — 30%, 30C — 24%, 30D—21%

Proposals will be accepted on either rigid or flexible types or on both types of pavement. The Commission reserves the right to award either type on any contract or part of a contract at its sole discretion.

Proposals will be received at the office of the West Virginia Turnpike Commission, 1340 Wilson Street, Charleston 5, West Virginia until 9:00 A.M. Eastern Standard Time, and thereafter at the House of Delegates Chamber, State Capitol, Charleston, West Virginia until 10:00 A.M. Eastern Standard Time, on September 15, 1953, at which time and place said proposals will be publicly opened and read.

WEST VIRGINIA TURNPIKE COMMIS.
August 15, 1953 D. H. Morton, Chairman

ESTIMATORS

Fully experienced in industrial and commercial buildings and mechanical installations (machinery, equipment, piping, etc.)

These openings in Cleveland Office offer excellent working conditions with paid vacations, sick leave and participating group insurance program. Presently working scheduled 5 day 45 hour work week.

Replies will be treated confidential and arrangements will be made to interview selected applicants. Please submit complete resume stating experience, education, salary required and date available to

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Ferguson Building — Cleveland 14, Ohio

CIVIL ENGINEERS

Work on hydro-electric power developments. Write giving full experience record, qualifications and salary desired.

HARZA ENGINEERING COMPANY
400 West Madison St., Chicago 6, Illinois

EXPERIENCED CHIEF ESTIMATOR:

Must have ability and be capable of directing Estimating Department of a Building Contractors organization in the Southwest.

P-8737, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

REPLIES (Box No.): Address office nearest you
NEW YORK: 330 W. 42nd St. (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

WANTED PLANT Supt. by established Southern manufacturer of Structural Precast Concrete Products. Specializing in Floor and Roof systems. Annual Sales well over one million dollars. State age, experience, availability, salary and full particulars first letter. P-8706, Engineering News-Record.

WANTED—SEWER Foreman, experienced. Big job and high wages. E. A. Meyer Const. Co., 1539 Morrow Ave., North Chicago, Ill.

VALUATION ENGINEER — Wanted by large corporation operating nationally, for establishing and maintaining insurable values of its various plants. Permanent staff position. Location Northeastern Ohio. Salary open. Reply P-8749, Engineering News-Record.

WANTED — EXPERIENCEED estimator for building construction for long established Pittsburgh Contracting Company. Good opportunity for advancement. Reply to P-8750, Engineering News-Record.

ENGINEER AND Estimator experienced in all phases of bridge, highway and heavy construction. Excellent opportunity. Top salary and bonus. Permanent position with established Ohio contractor. Furnish complete details. P-8845, Engineering News-Record.

CONSTRUCTION SUPERINTENDENT—Wanted for a heavy construction firm within the New York City area doing large earth and rock excavation; heavy concrete construction; sheeting; shoring and underpinning. Prefer young aggressive type who is looking for an opportunity to prove his real worth. P-8835, Engineering News-Record.

CHIEF OF Party—Must be capable of handling survey parties and have thorough understanding of survey work pertaining to rights of way, curb and street lines, sanitary and storm sewer surveys, and general survey work. Apply —Howard Madison, Township Engineer, 1 Main Street, Woodbridge, N. J. Phone WO 8-1200, Extension 7.

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P-8798, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

POSITIONS VACANT

TRANSIT MAN—For inside and outside work. Must have thorough knowledge of engineering, drafting and calculating, and be thoroughly familiar with deed and conveyance, and tax map work. Apply—Howard Madison, Township Engineer, 1 Main Street, Woodbridge, N. J. Phone WO 8-1200, Extension 7.

CIVIL ENGINEER and Engineering Aides experienced in soil testing for highway and airport construction. Base office vicinity New York City. Willing to travel. State starting salary. P-8965, Engineering News-Record.

ESTIMATOR—experienced on all types of construction with emphasis on piers, docks and bridge foundations using floating equipment; by long established N. Y. construction firm. Submit full resume of education, experience, salary desired and when available. Reply P-8964, Engineering News-Record.

DETAILERS — STRUCTURAL Steel Experienced on Bridges desirable. Top rates, voluntary overtime, permanent. Write or Phone. Erdner Engineering Co., 29 E. Madison St., Chicago 2, Ill.

REFUSE DISPOSAL Engineer $8520-$10,700 per year. The City of Philadelphia has an opening for a mechanical engineer with 7 years experience to direct all activities of the refuse disposal division of the Department of Streets. Opportunity for professional advancement and for the development of one of the largest incineration plant expansion programs in the country. For further information, Apply Personnel Department, Room 201, City Hall, Philadelphia.

EXPERIENCED CHECKERS wanted for work on structural and miscellaneous steel. In application give experience record, salary requirements and date available for work. Carolina Steel & Iron Co., Greensboro, N. C.

CITY ENGINEER wanted immediately for community of 50,000 pop, in So. New England. Prefer graduate C.E., registered or eligible for registration, capable of supervising engineering aspects of public works program under direction of Public Works Director. Salary — $6,000.00. P-8391, Engineering News-Record.

HIGHWAY DRAFTSMAN with experience in the preparation of construction plans and estimates. Experience on small bridges desirable. Good inkwork is a prerequisite for consideration. Work located in Washington, D. C. area. Submit resume including photograph, (if available), salary requested and availability to P-8909, Engineering News-Record.

SELLING OPPORTUNITY OFFERED

SALES ENGINEERS—Albany, New York and Pittsburgh, Pennsylvania with established national concern selling prefabricated metal products to engineering and construction markets. Position offered is permanent and presents excellent future with aggressive, progressive and expanding organization. Engineering degree desirable. Previous sales experience unnecessary. Age 24 to 30. SW-8254, Engineering News-Record.

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WANTED ENGINEERS, Designers, Draftsmen, Structural, Piping, M.E., C.E., E.E., and Industrial, also Teachers and Chemists. Cleveland Engineering Agency, 2132 E. 9, Cleveland.

POSITIONS WANTED

AVAILABLE IN sixty days. Construction Superintendent for highway work, drainage, irrigation or levee work. Over twenty years experience. Can supervise, plan, and handle work of this kind on the project level. Knowledge of Engineering and thoroughly familiar with government contracts. Prefer Southern California or Arizona. Can also bring Master Mechanic who is thoroughly familiar with repairing of all makes of draglines and crawler equipment. Mechanic has his own tools. PW-8770, Engineering News-Record.

ESTIMATOR WITH field experience as Superintendent familiar with all types of Building Construction. Also experienced in making Engineering Estimates for Engineers. References, address E. Harold Bowen, 1108 E. Belvedere Ave., Baltimore 12, Md.

CONSTRUCTION SUPERINTENDENT: Concrete pipe manufacture, considerable experience. PW-8857, Engineering News-Record.

SANITARY ENGINEER — Age 39, married, M.S. degree, 7 years experience in sanitary engineering field including design, construction and administration. Desires responsible permanent position. Prefer far West. Registered CE in California. PW-8863, Engineering News-Record.

ENGINEER—15 Yrs. exp. desires position on design concrete or steel structures. Prefer part-time N.Y. or N.J. area. PW-8832, Engineering News-Record.

ARCHITECTURAL STRUCTURAL Engineer experienced in industrial and commercial design, field-supervision and estimating desires position with Architects, Engineers, or Constructors. PW-8850, Engineering News-Record.

ENGINEER, REG. P.E. Reports investigations, settlement of contractors' claims. 45 years experience. Design, construction. Turnpikes, tunnels, buildings, foundations, etc. PW-8746, Engineering News-Record.

STRUCTURAL ENGINEER — Graduate C.E., Reg. P.E. in N.J., N.Y., Pa., & Mass.; 31, married, children. 7 years experience in office supervising complete design of industrial bldgs., hospitals, and institutions. Resident metropolitan N.J. PW-8487, Engineering News-Record.

GENERAL SUPERINTENDENT 25 years experience in heavy construction, refineries, chemical plants, ammonia plants, booster stations, (all types), loading terminals and gasoline plants. Age 47, married in good health and free to travel. Prefer foreign work, pass ports and etc. are valid. Familiar with all types of heavy construction and the setting up of construction organizations. PW-8907, Engineering News-Record.

ESTIMATOR, 7 yrs. experience in heavy construction, institutional work: excavation, concrete, masonry, carpentry. C.E., LOngacre 4-5850 or write PW-8889, Engineering News-Record.

STRUCTURAL ENGINEER—B.S., M.S. 3 years experience on bridges (including prestressed) and other structures. Prefers South or Mid West. PW-8935, Engineering News-Record.

STRUCTURAL DESIGNER, Architectural Draftsman, industrial and commercial-buildings, prefer Central States. PW-8900, Engineering News-Record.

SUPT. EXTENSIVE experience in rock, blasting, drilling—concrete, earth moving. Foreign or Domestic. PW-8973, Engineering News-Record.

ELECTRICAL ENGINEER—Designer, 15 years commercial, industrial, chemical. Contract drawings, specifications, estimating, field survey and installation supervision. Seeks supervisory position with architect, consulting engineer or contractor, prefer East. PW-8978, Engineering News-Record.

(Continued on the opposite page)

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POSITIONS WANTED

(Continued from opposite page)

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EXECUTIVE ENGINEER—Age 39, B.S. C.E., registered several states. Broad const. management experience industrial-chemical plants U.S. and abroad. Heavy labor and customer relations. Top echelon positions large projects, now project manager, salary $20,000.00 year. Available position as Manager of Const. or Project Manager about Sept. 1st. Excellent references and connections. Write PW-8932, Engineering News-Record.

CONSTRUCTION ENGINEER C.E. Graduate age 53 long successful administrative experience all phases large scale general construction and industrial chemical in field and office. Employed seeks new connection, top references. PW-8928, Engineering News-Record.

C.E., LEHIGH Graduate '49, has diversified field and office experience with large industrial contractor, and design with consultants. He desires better position with responsibility and future in Metro. New York-New Jersey area. Ambitious, willing to learn and work. PW-8887, Engineering News-Record.

GRADUATE ENGINEER: 15 years supervision, domestic and foreign, installation and inspection of equipment for steam power plants, petroleum industries, and related fields, including periodic inspection during plant operation, desires foreign position. Age 45, single. PW-8568, Engineering News-Record.

REAL ESTATE Appraiser, with architectural and building contracting background, 24 years experience, graduate recognized university, degree, licensed. PW-8560, Engineering News-Record.

CHIEF ESTIMATOR, heavy construction. Accustomed to responsibility office and field. Licensed P.E. Bidding, administration, cost control. Desire change with future with New York City Contractor or Consultants. PW-8961, Engineering News-Record.

CIVIL ENGINEER, 34, graduate 1941, N.J. license, wants job as asst. super or project engr. on large project or super on small one. Varied experience on industrial, powerhouse, airfield, and other types of construction. Know plans and specs. and can supervise trades. Prefer N.J. or N.Y. contractor. PW-8945, Engineering News-Record.

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FS-8949, Engineering News-Record

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16"	4	1/8"	1/32"	28 Oz.
18"	4	1/8"	1/32"	28 Oz.
20"	4	1/8"	1/32"	28 Oz.
20"	5	1/8"	1/32"	28 Oz.
24"	4	1/8"	1/32"	28 Oz.
24"	5	1/8"	1/32"	28 Oz.
26"	5	1/8"	1/32"	28 Oz.
30"	4	1/8"	1/16"	32 Oz.
30"	5	1/8"	1/16"	32 Oz.
30"	6	1/8"	1/16"	32 Oz.
36"	6	1/8"	1/16"	32 Oz.
42"	5	1/8"	1/16"	32 Oz.
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MARION shovel, Ward-Leonard electric type 151-M, GE equipment, 23' dipper, 35' boom, 7½ yd. manganese front dipper, oversize electrical equipment, 42" crawler shoes, machine is sectionalized for quick assembly, 1 spare Esco 8½ yd. dipper, S/N 8508, major overhaul in 1953. LOCATION: Crofton, Nebr.

DRAGLINE attachment for the above Marion shovel, 90' boom, 8½ yd. Hendrix drag bucket, LOCATION: Pickstown, South Dakota.

MARION walking dragline model 7200, diesel-electric, Ward-Leonard control, S/N 9072, w/120' boom, 8½ yd. Hendrix drag bucket, drag and hoist power Cleveland diesel engine model GM-8-278A 750 hp. at 720 RPM, driving motor-generator set, all driving motors and generators manufactured by GE Co., new in 1949 and used only two seasons. LOCATION: Crofton, Nebraska.

MARION dragline model 111-M w/Cummins L-6 diesel engine, 90' boom, 5 yd. Hendrix bucket, light plant, S/N 8299, major overhauled in 1953. LOCATION: Crofton, Nebraska.

MARION dragline model 111-M w/GM twin 6-71 diesel engine, electric swing, 70' boom, 5½ yd. Hendrix drag bucket and 90' boom w/4 yd. Hendrix bucket, light plant, S/N 8606, major overhauled in 1952. LOCATION: Pickstown, South Dakota.

SHOVEL attachments for the 2 Marion model 111-M drags, 3½ yd. dippers w/spare 4¼ yd. Esco dipper. LOCATION: Kansas City, Missouri.

BUCYRUS-ERIE model 54-B combination shovel and dragline, 50' drag boom, Buda diesel engine, light plant, S/N 69835, LOCATION: Crofton, Nebraska.

NORTHWEST model 95 dragline, S/N 13498, w/Murphy diesel and standard 60' boom w/2 - 10' extensions, major overhaul in 1953. LOCATION: Crofton, Nebraska.

BUCYRUS-ERIE model 51-B combination shovel and dragline, 2 yd. S/N 45174, w/Cat D-17000 engine, wide crawlers, 70' boom, light plant, machine rebuilt in March 1953. LOCATION: Wichita, Kansas.

FOUR KOEHRING model 605 combination dragline and clamshell machines, S/N's C-4999, C-5085, C-5195 and C-5273, 50' standard boom w/2 - 10' extensions, Cat D-13000 engine, Kohler light plant, high gantry and long-wide crawlers, LOCATIONS: One at Crofton, Nebraska, two at Wichita, Kansas, and one at Albuquerque, New Mexico.

PULL SHOVEL attachment for Koehring 605 above, 1½ yd. dipper, LOCATION: Wichita, Kansas.

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2 JOHNSON batch plants, C.S., 300 bbl overhead storage, elec. or gas powered, two 1 yd. batchers w/elec. dial scales or beam scales, RR unloading screw and truck hopper, each w/400 bbl. silo, LOCATION: Topeka, Kansas.

2 JAEGER Model H concrete finishing machines, 20 to 25', LOCATION: Topeka, Kansas.

2 MULTIFOOTE pavers, Model 34-E dual drum w/GM 6071 diesel engines, aux. water tank, 3" pump, used less than 400 hours, S/N's 46-D-512 and 46-D-515, LOCATION: Topeka, Kansas.

2 KOEHRING pavers, model 34-E dual drum, diesel power, S/N's 19928 and 17553, LOCATION: Topeka, Kansas.

25 INTERNATIONAL KBS-7 BATCH TRUCKS w/Daybrook double batch bodies, 5 yd. capacity w/7" heavy duty hoists, 2 speed axles, 900x20 tires, LOCATION: Wichita, Kansas.

Heavy Hauling Trucks & Scrapers

15 EUCLID BOTTOM DUMPS, Model FDT, 15 yd. capacity, GM 200 hp diesel, Fuller transmissions, drivers cabs and trailer sideboards, S/N's 4688, 4690, 4691, 4778, 4779, 5004, 5005, 5006, 5029, 5030, 5048, 5114, 5148, 5149, 5150, 5151, 6777 and 6779, LOCATION: Wichita, Kansas.

11 MACK REAR DUMP TRUCKS, Model LRSW, Buda 350 hp diesel, 32 ton capacity, sideboards, 1400x24 fronts, 1600x24 rear duals, currently installing new Cummins diesel 300 hp engines, LOCATION: Crofton, Nebraska.

LeTOURNEAU TOURNAPULL Super C w/LP scraper, Cummins 150 hp engine, 12 yd. cap., LOCATION: Topeka, Kansas.

11 CATERPILLAR DW-20's, 1951 models, power steering, 3 yd. top extensions, S/N's 11C6, 11C3, 11C8, 11C7, 11C11, 21C21, 21C22, 21C23, 21C25, 21C26 and 21C27, LOCATIONS: 7 at Wichita, Kansas, 2 at Crofton, Nebraska, 2 at Albuquerque, New Mexico.

5 EUCLID Model 8TDT-148H motor scrapers, year 1951, Cummins diesel, power steering, Fuller transmissions, 3 yd. extensions, S/N's 12220, 12221, 12222, 12223 and 12224, LOCATION: Crofton, Nebraska.

LeTOURNEAU Model G Scraper, 6 yd., S/N S6134, LOCATION: Albuquerque, New Mexico.

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CATERPILLAR No. 12 motor grader, S/N 8T3745, front 900x24, 10 ply tires and rear 1300x24, 8 ply tires, lights, LOCATION: Crofton, Nebraska.

Compressors & Miscellaneous Pieces

GARDNER-DENVER Model WBK500 compressor w/Cat D-13000 engine, mounted 4 tires, S/N 110396, LOCATION: Topeka, Kansas.

CHICAGO-PNEUMATIC Model PO-8 compressor w/Cat D13000 engine, mounted on 4 tires, S/N 42909, LOCATION: Wichita, Kansas.

CONWAY No. 75 mucker w/75 hp 220/440 volt motor, 8½' boom, ⅜ yd. bucket, LOCATION: Pickstown, South Dakota.

McKEEMAN TERRY No. 7 steam pile w/leads, S/N 8317, LOCATION: Pickstown, South Dakota.

15 GARDNER-DENVER Model CF 99 drifters, LOCATION: Kansas City, Missouri.

MASSCO Model 38 bit grinder, Continental power, S/N 554, LOCATION: Pickstown, South Dakota.

2 INGERSOLL-RAND type FS blowers, GE motors, 100 hp., 2400 volt, 3 phase, 60 cycle, single stage 7500 CF mat 2 lbs, LOCATION: Kansas City, Missouri.

2 SPERRY Gyroscope search lights, 60", portable, Model 1941A, LOCATION: Pierre, South Dakota.

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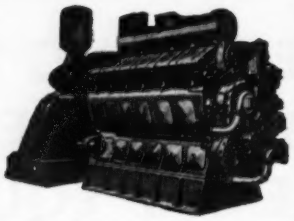

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750	General Motors	12-567	1080	720	150	Worthington	GC-4	225	450
500	Baldwin	VO-8	750	514	150	Ingersoll-Rand	8-4	225	600
500	General Motors	8-278A	750	720	150	Buckeye	80	240	600
500	General Motors	8-567	720	720	100	Worthington	BB-5	150	600
480	Worthington	DD-8	700	360	100	General Motors	3-268A	150	1200
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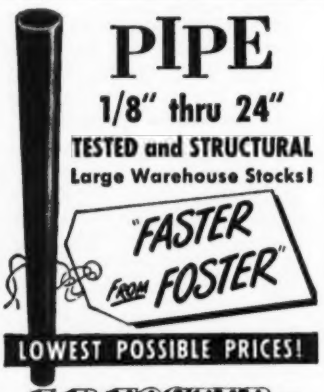

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Baker-Lull stable adds another workhorse

For approximately 2½ years Baker-Lull has been breaking axles and bending boom arms to develop a Shoveloader that could take the hard use and rough terrain encountered in the construction industry. The result is a unit that is basically a rubber-tired, four-wheel drive, 1½-yd. front-end loader with a maximum lifting capacity of 9,000 lbs and a general duty lift rating of 6,000 lbs. Optional front, rear or four wheel steering is hydraulically boosted.

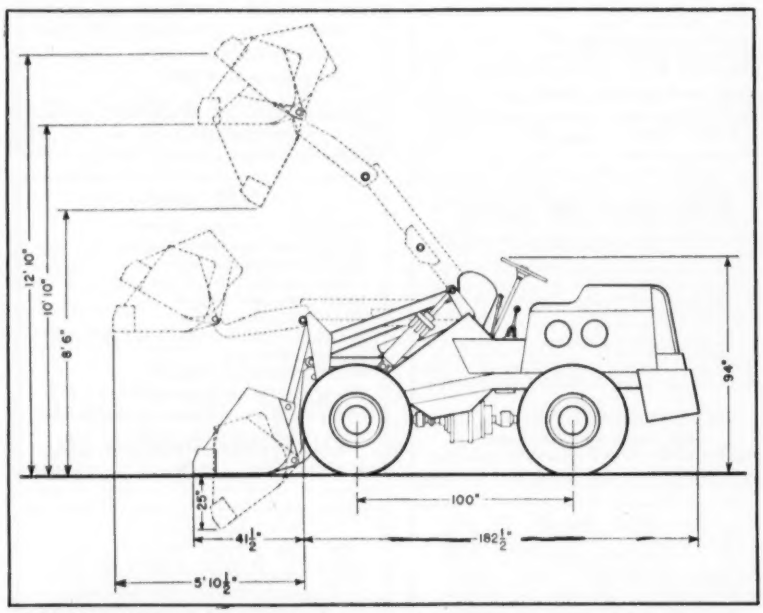
• **The business end** of the loader is actuated by a 1,200-psi hydraulic system using gear-type pumps as a power source. Raising and lowering the bucket is accomplished by a single seven-inch hydraulic ram with two separate cylinders used to control bucket action. A fixed linkage arrangement creates an automatic crowding action of the bucket into the bank or stockpile. This is said to assure full capacity loads.

Of particular importance is the amount of downcrowd permitted. The bucket may be forced 25 in. below the level of the tractor, and thus may be used as an excavating unit or for removing hard packed surface deposits.

In order to keep the bucket full at all angles of lift the booms have been designed with parallelogram action. In this manner the bucket, through all stages of elevation or depression, will maintain the degree of tilt originally set by the operator. Further, should it be desirable to tilt or rock the bucket into the material to be loaded this may be done by actuating both the hoist and tilt cylinders simultaneously. The bucket may also be shagged or slammed to remove sticky materials.

The bucket covers the 10 ft 10 in. to maximum lifting height in 8 sec and lowering takes only 5 sec. Dumping requires 1.5 sec.

• **A salient feature** of the loader and one that gave the manufacturer reason for extensive experimentation is the



DOWNCROWD of 25 in. permits the use of the unit as an excavator while the dumping height of 10 ft 10 in. allows its efficient use as a loader.

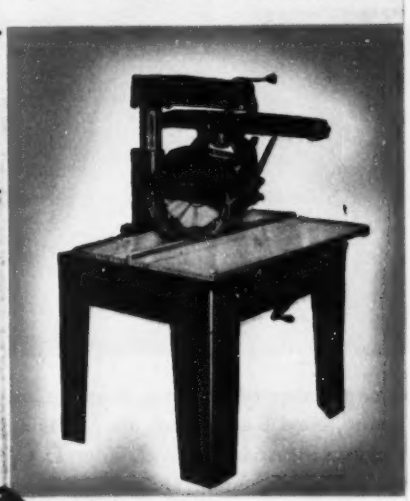
"On-the-Job" Sawing Center Costs Only 10¢ per hour with DELTA Radial Saw

$1,300,000 construction with saw investment of approximately $400 at Metcalfe-Hamilton Construction Companies in Kansas City, Mo.

A job-site sawing center with Delta radial saws mass-cuts material, frees carpenters for actual construction, says Raymond D. Sharpe, manager of this project to erect three apartment buildings totaling 172 units.

"For excellent performance, ease of operation, safety, versatility and economy, Delta radial saws can't be beat," says Mr. Sharpe. "Our on-the-job installation costs only 10 cents per hour—does cross-cutting, ripping, beveling, dadoing and general mill work. In 4000 hours of hard use, the only maintenance, except for blade wear, was one new switch."

Here, truly, is the way to cut costs, as live-wire builders the country over are discovering to their profit. Use the coupon to get complete data on Delta radial saws.



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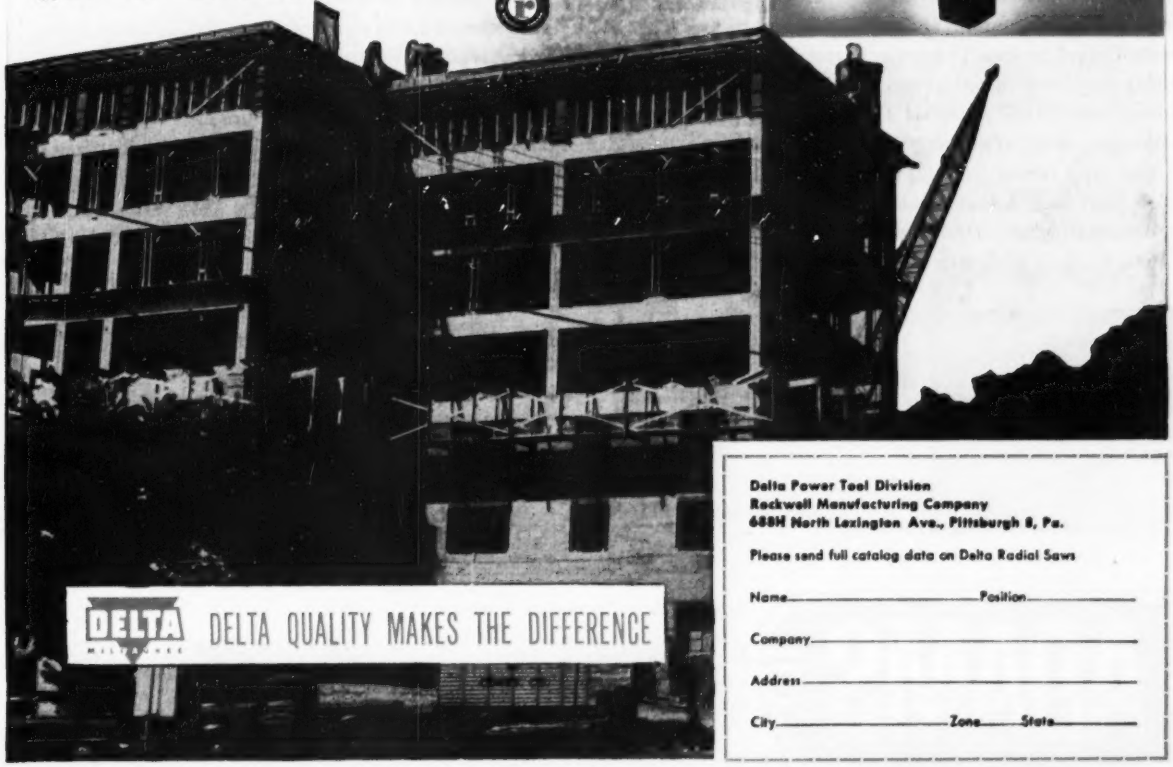

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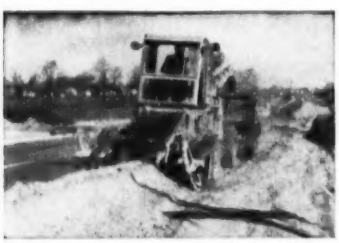
Adams TraveLoader

Speeds Loading Operations

For Contractors

Like many other contractors, Burrell Construction Company, New Kensington, Pa., finds a wide variety of uses for Adams TraveLoader. D. C. Traister, General Superintendent, says, "We operate two Adams TraveLoaders. These machines are kept busy loading surplus material on street construction jobs, loading stockpiled material for road and street grades, etc. We particularly like the heavier construction and better traction of the TraveLoader." . . . Ask your local Adams dealer to give you a working demonstration of how the TraveLoader will cut loading time and costs—for you!



Here a road contractor uses an Adams TraveLoader for picking up surplus dirt on a road-widening job.

For Counties

Cass County, Indiana, uses an Adams TraveLoader for picking up surplus ditch and shoulder material in the process of maintaining proper drainage on its system of 1150 miles of roads. Ross Helms, Road Supvr., says, "We don't know how we could accomplish this program without the TraveLoader. We have loaded as many as 185 trucks in one day. Some days we sell enough dirt to pay operating expenses. We also like the TraveLoader for its speed in loading from stockpiles." . . . See your local Adams dealer for an on-the-job demonstration of the high-speed, high-performing TraveLoader.

This county-owned TraveLoader is loading gravel from stockpile for road resurfacing operations.

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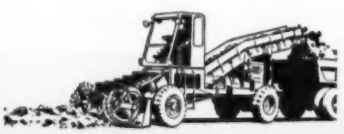
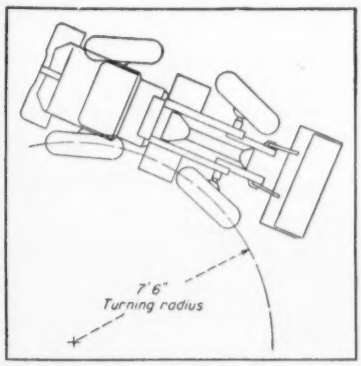


Motor Graders TraveLoaders Pull-Type Graders



FOUR-WHEEL STEER increases maneuverability of the machine.

axle design. Frequently with heavy equipment of this type, installation of conventional straight axles results in excessive axle deformation and breakage. The Baker-Lull approach to the problem is a planetary gear reduction type axle. Reduction in this design is three to one and therefore it is claimed that strain is lessened by 300% over that encountered with conventional axles.

To aid in rough terrain operations the rear axle is designed to oscillate 23 in. about the longitudinal axis of the machine. This makes it possible to keep the machine level and preserve maximum ground pressure on all four tires at the same time, thereby maintaining the advantages of four-wheel drive. Attachment of the front axle is rigid for stability.

To guard against dragging bottom, under-clearance is kept at 15 in.

• **The engine** used in the loader is of Hercules manufacture and may be either gasoline or diesel. Brake horsepower of each engine, rated at 2,100 rpm, is 77 bhp for the six-cylinder diesel and 93 bhp for the six-cylinder gasoline engine.

Power is transmitted through a metallic faced clutch and conventional five-speed transmission, but a Baker-Lull designed shuttle gear mechanism has been inserted in the power train. This shuttle gear system is said to permit quick changing of direction and thereby speed up loading operations.

At engine speed of 2,100 rpm the loader may be operated through five speeds, forward and reverse, ranging from 2.4 to 20.1 mph. Total gear reduction is 108:1 in first, 13.5:1 in fifth gear.

• **The tractor** has a fairly long wheelbase, 100 in., but this length is considered necessary to assure good balance and four-wheel traction without excess weight. Even with this long wheelbase, however, four-wheel steering cuts the turning radius to 7 ft 6 in. Turning radius of the front or rear-wheel steering models is 23 ft.

For further balancing of the loader, a ballast box at the rear may be loaded up to 2,000 lbs.

• **Operator safety** was carefully considered in the designing of the machine. Seats are located to the rear of the machine and above the engine to give the operator a full view of the working edge of the bucket without his being endangered by the working parts of the loader mechanism.

• **In addition to heavy loading** operations the machine may be equipped with a 2½-yd bucket for coal and snow loading, 48-in. forks for material handling or a standard 92x26½ in. bulldozer blade.

Standard equipment includes two headlights, two combination stop and taillights and two adjustable spot lights. BAKER-LULL CORP., 314 W. 90TH ST., MINNEAPOLIS 20, MINN.

New spur gear hoist units added to chain hoist line

A total of 55 different models and sizes of spur gear hoists have been added to the Coffing Co. line. Included among the units are 15 sizes of single- and multiple-chain hoists with capacities from ¼ to 25 tons. For specialized applications there are now plain and geared army-type hoists from ¼ to 10 tons, low headroom hoists from 1½ to 24 tons, clevis connected types from ¼ to 10 tons and extended handwheel hoists from ¼ to 3 tons.

In the army and low headroom models, the hoist is an integral part of the trolley. The trolley may be plain or geared. The advantage of the design is that it permits hoists to operate where lack of headroom prohibits the use of standard units.

The clevis connected hoists are used where lack of headroom precludes the use of the standard hoist and trolley hook-up. With this type, headroom is gained by removing the top hook and suspending the hoist from a specially designed trolley clevis. Three to 16 in. of headroom can be saved in this manner.

Extended handwheel hoists are used in the handling of large, bulky loads. On this model, the handwheel is extended to a maximum of ten feet to allow the operator to stand at a distance from the load. COFFING HOIST CO., DANVILLE, ILL.

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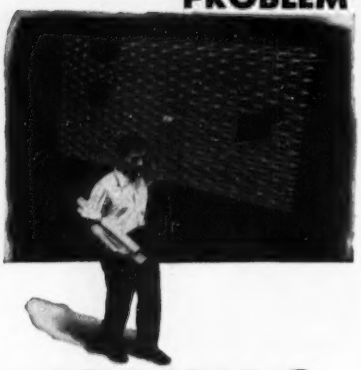

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CRAWLER MOUNTING enables the unit to operate under adverse conditions.

Schield heralds crawler unit

After eight years of producing one size and model crane and excavator unit —a 6-ton capacity, ¾-yd, truck-mounted rig—Schield Bantam has introduced a 5-ton crawler-mounted unit selling for $9,350.

Stability is obtained through the use of extra long tracks, 96 in. between sprocket centers, and an 80-in. spread between track centers. Clearance is only 10½ in.

Standard tracks are 16 in. wide and have a bearing pressure of 5 psi while 24-in. tracks with a bearing pressure of 3½ psi are available. In the works but not yet available are 32-in. tracks that will cut bearing pressure to an estimated 2 psi, almost within the bearing capacity of a thick soup.

The C-35 Bantam, as it is designated, has two-speed independent travel that enables the operator to work a front-end attachment while traveling and swinging the machine—simultaneously or independently.

Except for adaptation for crawler mounting, the 8-yr old basic model has been changed only slightly. Some of the modifications include larger, air-cooled clutches; larger gears; improved cab ventilation; relocation of controls, and a hinged cab roof for wider vertical angle visibility.

Power is supplied by a 37-hp. engine (make and type optional) that moves the crawler unit forward and reverse at either ¾ or 1½ mph.

The quoted price of the equipment includes a 1,400-lb counterweight but does not include front-end attachments. Weight of the unit is 15,522 lbs.

Attachments available for the crawler unit include crane booms from 25 to 45 ft in length, ⅜-yd shovel, ⅜-vd dragline with fairleads, ⅜-vd backhoe, ⅜-vd clamshell and 1,400 to 1,800-lb pile driver. SCHIELD BANTAM CO., 221 PARK ST., WAVERLY, IOWA.

CRAWLER is chain driven.

Steam cleaning nozzle increases blast efficiency

In contrast to conventional steam cleaning nozzles that are usually round or rectangular in shape, the Steam-Blaster has a flat nozzle with a center blade. What this new development adds up to is a nozzle that directs the spray with reduced eddy turbulence and therefore, it is said, a harder hitting steam blast. The center blade is thought to create a pressure differential between the two flat planes of steam producing a knife-like cutting action at the point where the planes converge. According to the manufac-

Construction Costs are up 27% since 1949

Building Costs are up 24% since 1949

→ More bidders are going after every job.

→ Close figuring of costs will make the difference.

WILL YOU STILL BE IN BUSINESS when they separate the men from the boys? The 1953 Construction Costs Yearbook can help you sharpen your bids, shave expenses and come out on top. Even bigger, even more useful than last year's 402-page issue, EN-R's October 8th Costs Yearbook will contain this valuable information:

1. **Cost trends and outlook**
2. **Construction cost indexes**
3. **Building cost indexes**
4. **Highway price indexes**
5. **Dam and hydro-power cost indexes**
6. **Unit prices**
7. **Building trades wage rates**
8. **Materials prices**
9. **Financing costs**
10. **Compensation insurance costs**
11. **Equipment rental costs**
12. **Depreciation schedules**

The 1953 Costs Yearbook will also include a special fold-out insert showing the Petit system of construction cost prediction (first announced in last year's Costs Yearbook) over the full period from 1926 to 1953. It will also include the usual 20-city price charts and comparisons of the EN-R building and construction cost indexes with other well-known indexes.

Be sure you get your hands on a copy – for keeps – because you'll want it for reference all year long. Extra copies should be ordered in advance – $2.00 each. If you're a subscriber to Engineering News-Record, you'll get the 1953 Construction Costs Yearbook as part of your regular subscription. If you're not already a subscriber, send in your subscription now so you'll be sure to get this valuable reference when it comes out October 8th.

1953 Construction Costs Yearbook

ENGINEERING NEWS-RECORD

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turer, the flow is completely non-divergent, assuring maximum impact and minimum waste of pressure.

The nozzle is constructed with a bronze body and stainless steel blade and can be used with a straight or 45-deg union having a ¼-in. pipe thread. The orifice measures 1¼ by 0.04 in. AMERICAN NOZZLE CORP., 30 CHURCH ST., NEW YORK, N. Y.

Seven new power units added to I-H line

Seven new valve-in-head power units have been added to the International Harvester six-cylinder, gas-gasoline line.

Horsepower ratings for the units are: U-1091 (natural gas), 187 net hp at 1,400 rpm or up to 200 net hp at 1,600 rpm on factory-approved applications; U-450, 102 net hp at 1,800 rpm; U-406, 91 net hp at 1,800; U-372, 83 net hp at 1,800 rpm; U-269, 62 net hp at 1,800 rpm; U-240, 55 net hp at 1,800 rpm; U-220, 50.5 net hp at 1,800 rpm.

Basically, the new natural gas U-1091 power unit and the International UD-24 diesel power unit have many common components. Principal differences are that the UD-24's gasoline starting system and diesel fuel injection system have been eliminated in the U-1091. The new model is also equipped with lower compression pistons, a large updraft carburetor, magneto, spark plugs and a gear-driven, variable-speed governor.

The six other models use International motor truck engines. INTERNATIONAL HARVESTER CO., 180 N. MICHIGAN AVE., CHICAGO 1, ILL.

PUBLICATIONS

Clarifiers—A 24-page bulletin covers the complete line of Dorr clarifier mechanisms for round or square tanks as used in water, sewage and industrial waste treatment. Sludge handling equipment is also briefly described. Bulletin No. 6192, THE DORR COMPANY, INC., BARRY PLACE, STAMFORD, CONN.

Blasting Technique—A new 28-page booklet, printed in Spanish for the benefit of South and Central American mine, quarry and construction engineers, explains in detail the millisecond delay system of blasting. Included are photographs to show how operators, with charges fired at the bottom of the holes, can achieve initial movement at the toe, virtually no premature escape of gases, sharply reduced vibration and noise, and improved thoroughness of break-up. Sketches show 21 variations of the system. The booklet entitled "Sistema de Voladura Rockmaster 16" is available from EXPLOSIVES DEPARTMENT, ATLAS POWDER COMPANY, WILMINGTON 99, DELAWARE.

Road rebuilding—Available for showing is a new 16-mm sound color movie featuring the Hyster grid roller in action on different types of blacktop jobs, including salvaging and rebuilding of roads and streets. The movie illustrates the grid roller method for salvaging aggregate and binder in old bituminous surfaces, and a new faster way to compact road fills, sub bases and rolling surface courses. HYSTER CO., 2902 N. E. CLACKAMAS ST., PORTLAND 8, ORE.

Earthmoving equipment—A new 48-page booklet covers all types of earthmoving equipment manufactured by the Euclid Road Machinery Company. It also contains information on the selection of the proper type of equipment for various types of work. Brief specifications and typical performance figures are given for the various models and individual design features are explained. THE EUCLID ROAD MACHINERY COMPANY, CLEVELAND 17, OHIO.

Insulating glass—Presenting the advantages and application of insulating glass in the air-conditioned home, this seven-page booklet gives some tips on building orientation, planting, and use of trellises, service areas and awnings. Form 23, LIBBY OWENS GLASS COMPANY, NICHOLAS BUILDING, TOLEDO 3, OHIO.

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EDITORIALS

Those Spanish bases

POLITICAL EVENTS of the last two weeks in France and Morocco should dispel any lingering doubts of the desirable strategy of establishing U. S. military bases in Spain.

The persistence with which both the State and Defense Departments have pursued an agreement with the Spanish government is proof that they have never faltered in the belief that naval and airbases on the Iberian peninsula are essential. Nevertheless, the recent and laudable efforts at budget cutting by both Congress and the Administration poised the ax over the Spanish bases on a number of occasions. In addition, Generalissimo Franco has been a hard bargainer, and his demands have sometimes been discouraging to our negotiators. Now, however, the strike of French government employees and the struggle for the power of the Sultan in Morocco emphasize the rightness of the decision not to abandon the plan for Spanish bases.

With over a billion dollars of construction money committed to nine airbases in France and five in Morocco, other Army facilities in France and naval bases in both countries, it was not unnatural to wonder if the demand for additional bases in Spain were not just another example of the military never being satisfied that it has enough of anything. The facts, however, appear to be otherwise. The difficulty has been that our strategic planners have hesitated to state them frankly for fear of antagonizing the French and Moroccans.

The French strike of government employees, paralyzing transportation and communication, highlights the danger to our facilities there in case of war. If we had to abandon them and retreat (the possibility that our statesmen feared to mention publicly) a bastion behind the Pyrenees would be very desirable. Such a second line of defense would be a powerful adjunct to the one that we could establish in the British Isles. A civil war in Morocco, at a time when we needed native cooperation, would also greatly complicate operations on our bases there.

Even without prospects of internal troubles in France and Morocco, additional bomber bases in Spain would have great potential value in an atom bomb war. Probably we would never strike first in such a conflict. That means that we need enough bomber bases safely located within striking distance of the enemy to assure that all of them could not be put out of commission before we could send out retaliatory bombing missions. The four bomber bases in Morocco, plus one in Libya, are not believed to be enough to give complete assurance on this score. Add to them bases in Spain, however, and we would have a formidable potential for effective retaliation. Most important, the mere existence of more bases than an enemy could knock out in one huge operation would be likely to dissuade him from ever starting an atom bomb war.

Engineers and contractors have been interested in the Spanish base deal as opening a new field for the exercise of their construction talents. They can also feel sure that their desires are not directed toward a foreign boondoggle type of project, but correspond with the real interests of national defense. Moreover, on the commercial side (and even from a humanitarian viewpoint) U. S. expenditures in Spain will have sound investment value. Spain needs help and, brought back into the orbit of world trade, could raise her standards of living and thus contribute to the prosperity of her customers. Signing of the Spanish agreement for U. S. bases will be a constructive step all around.

Facts on fire needed

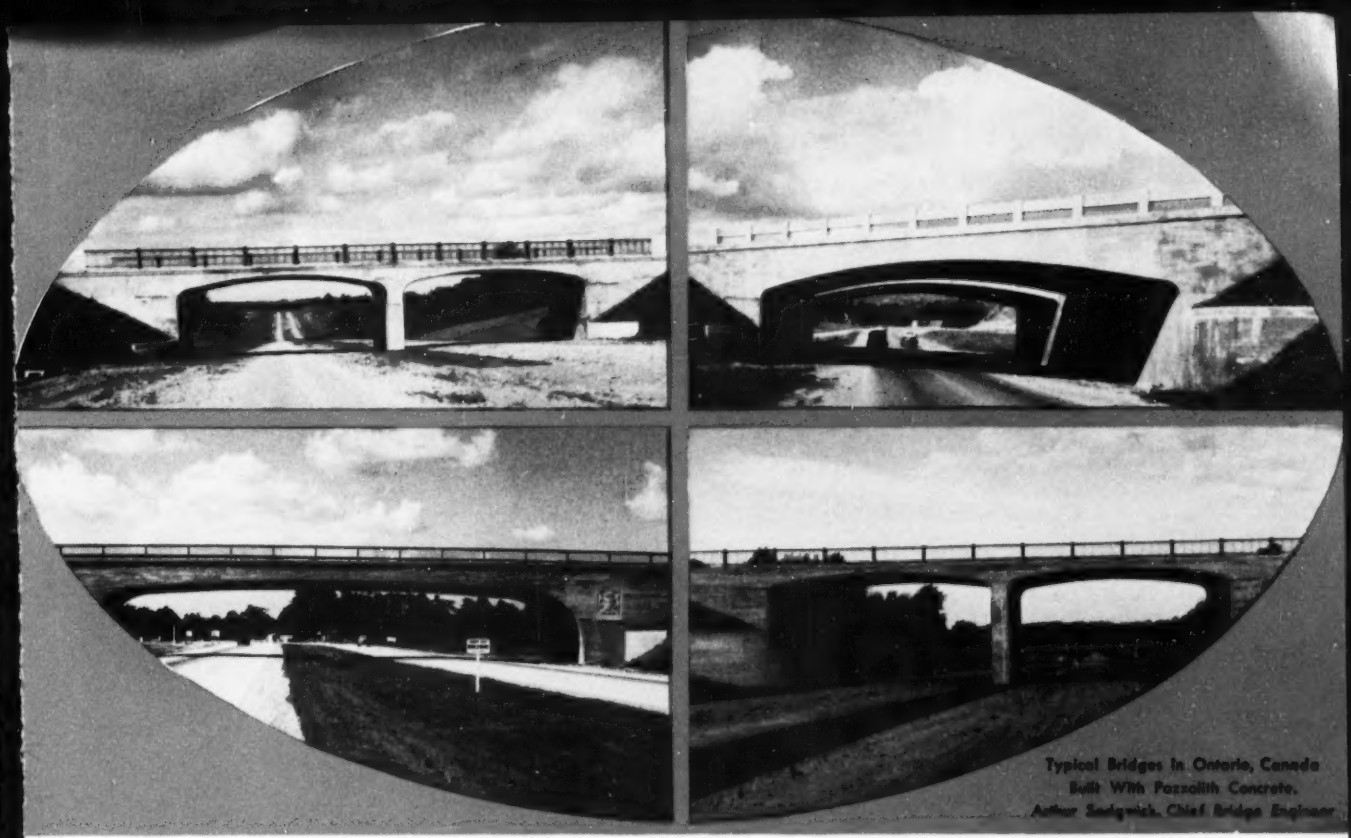
INDUSTRIAL BUILDING DESIGNERS will look hopefully to General Motors to make public all facts and its conclusions on the fire that wrecked its 1,500,000-sq ft transmission manufacturing plant near Detroit two weeks ago. The fire is believed to have been started by a spark from a welding torch igniting a cleaning and preserving fluid. It is reported to have spread by conveyor lubrication, pitch roofing, oil-soaked metal chips from machining operations, oil-saturated wood-block flooring and by hosing with water.

If this was merely a case of poor housekeeping in which oil and grease deposits were not cleaned up properly, that fact should be made plain. If, on the other hand, such deposits are inevitable in manufacturing operations, then building designers will have to reexamine or question some of their practices.

For example, are firewalls used frequently enough? Are water sprinkler systems useful or actually dangerous where oil fires are a possibility? Do conveyor systems require a type of lubrication that is a potential fire hazard? Should all roofing materials be incombustible?

These are the kind of questions that are worrying industrial building designers who cannot dismiss the General Motors fire as an unexplained disaster and go on designing similar buildings as if nothing had happened. For fire safety is as much the designer's responsibility as is structural safety. And like structural safety, fire safety must be designed into a building to such a degree that it will be effective almost regardless of the type of occupancy that occurs.

It is definitely in the public interest that our factories be safe—for the worker and in order that product output not be suddenly curtailed when it is badly needed. It seems almost certain that there is a lesson in this "unbelievable" fire which, if learned, will help make all future factories safer and better. But, to learn it, all possible facts on the fire must be known.



Typical Bridges In Ontario, Canada
Built With Pozzolith Concrete.
Arthur Sedgwick, Chief Bridge Engineer

90 Bridges In Ontario Are POZZOLITH CONCRETE

BACK in 1938 the Ontario Highways Department built two bridges of identical design — one with Pozzolith Concrete, the other with plain concrete. Their reason for employing Pozzolith was to increase workability, making practical the use of a low water-cement ratio concrete in a thin, heavily reinforced section.

Such marked improvements were obtained in the concrete produced with Pozzolith that since that time, with the exception of an interval during the war years, all highway department bridges in Ontario have been Pozzolith Concrete.

In other provinces and in many states, Pozzolith Concrete has similar acceptance for use in highway bridges.

Among the improved qualities obtained with Pozzolith Concrete are the following:

- GREATER DURABILITY — for longer life concrete
- REDUCED SHRINKAGE — for less cracking
- LOWER PERMEABILITY — for less "waterproofing" expense
- MINIMIZED SEGREGATION — for better appearance
- INCREASED BOND-TO-STEEL — for better construction
- EASIER PLACEABILITY — for lower placing costs

Full information on Pozzolith and "See-for-yourself" demonstration kit supplied on request . . . without cost or obligation.

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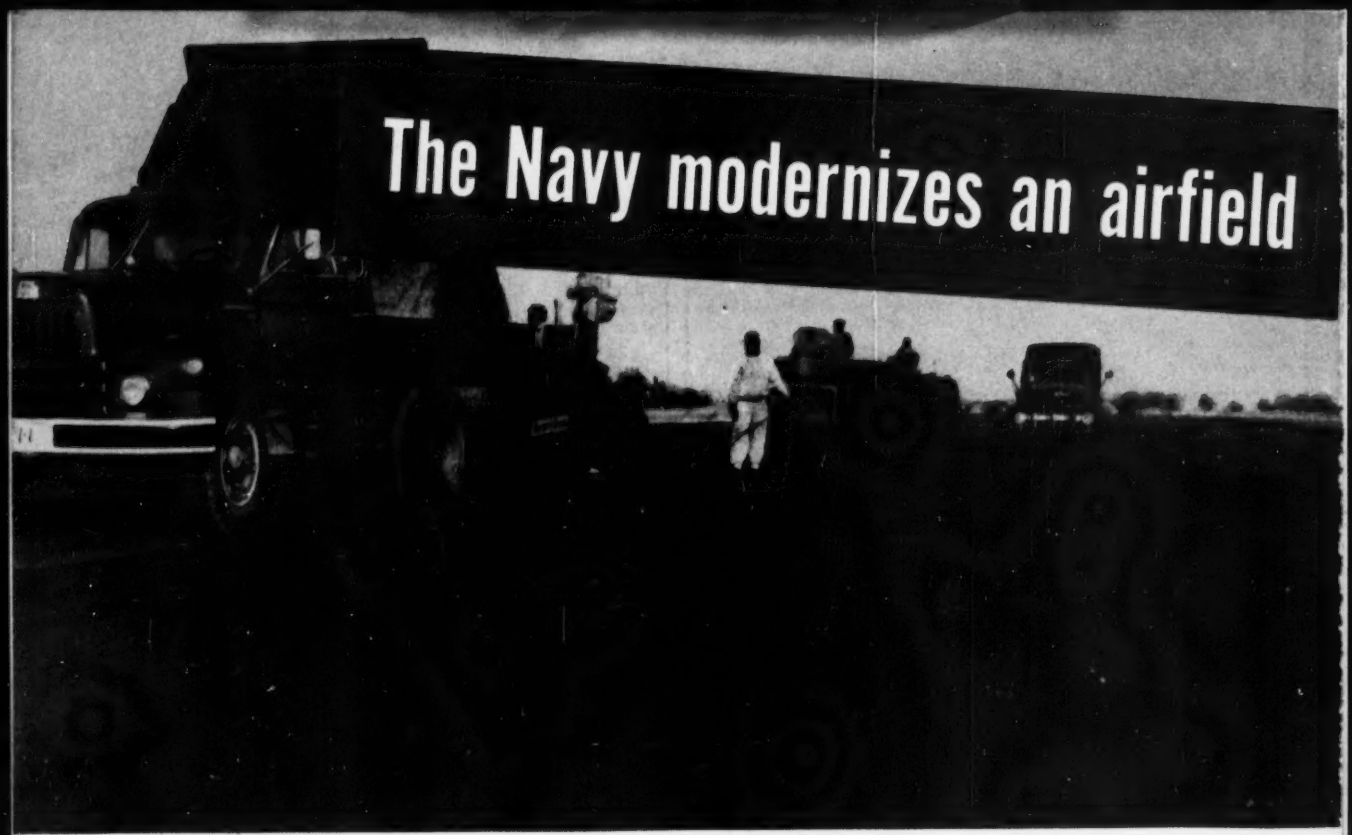

Hard-surfacing runways at U.S. Navy Air Development Center with 40,000 tons of Hot-mix Texaco Asphaltic Concrete

(large photo) Laying heavy-duty Texaco Asphaltic Concrete on one of the runways. Total thickness of the pavement ranges from 3 to 12 inches. Harry C. Erb, Inc., Bala, Pa., was the prime contractor.

(small photo) Texaco Cutback Asphalt for the tack and seal coats was applied by Asphalt Industries, Inc., Chester, Pa.

Runways of this airport at the Navy's Air Development Center near Philadelphia formerly had a bituminous-stabilized surface, which was no longer adequate. Officials in charge of the field decided last year that the volume and type of traffic now using these runways called for a heavy-duty pavement.

As a result, a hot-mix Texaco Asphaltic Concrete pavement, which varies in thickness from three to twelve inches, has been constructed over the existing runways. In addition to shock-absorbing resilience and the ability to deliver years of service with low upkeep, this pavement type offers other important advantages. It suffers no ill effects from ice-control chemicals and it has a low susceptibility to temperature changes. Snow removal is less of a problem on a dark asphalt surface, which causes snow and ice to melt faster.

The type of construction required by an airport runway, a highway or a street may range from a heavy-duty pavement like hot-mix asphaltic concrete, down to an inexpensive, waterproof mat. Texaco Asphalt Cements, Cutback Asphalts and Slow-curing Asphaltic Oils offer a type to fit every need. For help in choosing the asphalt type best suited to your requirements, write our nearest office for two Texaco booklets which supply useful information on all types of asphalt construction. The practical experience and the recommendations of our Asphalt representative in your area will also be helpful to you. Ask our office to have him get in touch with you.

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